

**Children Using Gestures and Its Integration with Speech for Communication: A
Comparative Study between Two Age Groups**

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Declaration

I therefore declare that this paper is the presentation of my original work. It is not submitted to any where not as a part or as a whole, for an award or a program, in this or any other universities.

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Dedication

To all those new born children whose presences have enlightened the world further.

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Abstract

Children need gestures to communicate with others. They communicate using different gestures. Unlike adults children have limited number of gestures as they have not acquired the capability of using a variety of gestures. It is seen that every gesture has a purpose of its own. Different gestures are used in different situations and also children's gesture varies according to some factors associated with it. While gesturing children not only use gestures but there is an amalgamation of speech as well. It is seen that there are different combinations of gesture and speech available which facilitates the communication. This paper examined the different types of gestures that the children use while communicating with others also the use of these gestures is overviewed along with the integration of speech. Two groups of children are studied, 14 months and 18 months.

Key words: gestures, types of gestures, children, gesture-speech combinations

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Chapter 1: Introduction

1.1 Introduction

Have you ever thought about speaking without using gestures? We, the adults, use gestures spontaneously while speaking. Gestures have become an integral part of our speaking as we believe verbal-gesture usage helps to deliver speeches more effectively. Now imagine about a child who is just 11 months old. She/he has not yet acquired the skill of speaking to articulate his/her views. Then, what is the medium of communication for the child? At this stage, gestures are the primary means of communication for the child.

Gesture of children plays an important role by helping the child to interact with others, also, engaging others in the interaction. Gestures are not only related with hands but other facial expressions, body movement are also involved with it. For children the usage of hand gestures takes place the most as they develop the fine motor skills earlier than the gross motor skills. Children use different types of gestures to communicate with elders. These gestures vary according to their age. Deictic gestures emerge at the age of 10 months. Deictic gestures specially known as pointing gestures are mainly used to point at something. Under this category some other gesture types are also present. From 10 to 12 months pointing gestures are used the most. Pointing gestures are used thoroughly as it is the simplest form by which communication can be facilitated. It is said that between the ages of 12-16 months iconic/representation gesture becomes visible. Children use symbolic representation to represent different objects. Representational gestures enhance interaction as children use different symbols to represent the ideas that they cannot express. As the age advances children start to use words along with the gestures to communicate more successfully. The one word stage evolves at the age 12 months. Along with gestures speech is an integral part. Children who have the ability to talk uses speech

along with gesture making communication easy for them. Also, as they use speech along with gestures the person to whom it is intended to can easily perceive the information and can act accordingly. The intentions behind these gestures are different. Children understand about the environment and use the gestures accordingly. They engage themselves with their parents in joint attentional framework. All this is done to communicate. Their ability in engaging parents is appreciative. Gesture also involves the use of different types of hand shapes for different functions. Hand shapes vary the most for pointing gestures as some children use the index finger, the whole hand. For representational/iconic gestures the toddlers use different hand shapes or their body parts for various symbolic representations. There are many combinations of gesture-speech which helps the children to communicate better. Before the two words stage these combinations of gesture and speech helps the children to produce sentence like meaning utterances.

1.2 Research Objective

The objective of the study is to examine the gestures children perform while communicating. Along with it the speech that is related with these gestures will also be studied. Also the usage of these gestures will also be focused.

1.3 Purpose of the study

The purpose of this research is to study about the use of different types of gestures that children use for communication. Also to see, how they integrate speech along with gesture for communication.

I became interested in this topic after seeing my niece using gestures to communicate while she was 12 months old. She pointed different objects also used different hand movements

to grab our attention. When she was 17 months old she used different hand shapes while communicating with us. The primary reason for all these gestures were to communicate with us.

1.4 Research Question

1. What types of gestures are used for communication?
2. How gestures help in the communication of children?
3. How children combine speech with gesture for easing communication?

1.5 Limitations

- There are very few organized day care centres.
- It was difficult to make the parents understand about the questions. As the questions had to be explained to them it is possible that the answers provided may not be hundred percent accurate. While filling up the questionnaire the parents were in a hurry as they came after their office. So, I doubt whether they provided the correct answer or not.
- As the observation has been done within a short span of time, the result that is obtained might not be precise. This research demands a study which will last for quite a certain period of time.

Chapter 2: Review of the Literature

2.1 History

Bulwer and Cordemoney address gestures as “the first of all languages” stating that they are understood everywhere and are universal (as cited in Corballis, 2009, p.20). According to Charles Darwin (1859) in *The Origin of Species*, humans are the descendants of apes, who transformed gradually adapting themselves for the world and struggling for existence (p. 64). Charles Darwin in his book *The Descent of Man* refers the role of gestures as “I cannot doubt that language owes its origin to the imitation and modification of various natural sounds, and man’s own distinctive cries aided by signs and gestures” (p. 86). Corballis (2002) in his book *From Hand to Mouth: The Origins of Language* has provided the most recent findings about the origin of gesture that has a correlation with Charles Darwin’s idea of human evolution. Corballis proposed that gesture has existed side by side with vocal communication for most of the time in the last two million years. According to Corballis, around 30 million years ago the great apes separated from the Old World Monkeys. Approximately 16 million years ago the brains of the great apes subjected to an increase in brain size which resulted an increase in thinking, enhanced representation of objects and the “capacity of using a form of protolanguage”. 5 to 6 million years ago “bipedalism” distinguished the early hominids from the other great apes hence freed their hands and arms for more effective gesturing (p.22-24).

“Protolanguage to grammatical language” begun when the genus Homo appeared sometime around 2 million years ago. Due to their increased brain size then that of other hominids “language became increasingly sophisticated” from then on. During this period, “language would have been primarily gestural, although increasingly punctuated by vocalizations”. “Necessary adaptations for articulating vocalization may have been selected, not

as a replacement for manual gestures, but rather to augment them.” Language could be expressed more or less independently by speech alone as found out by Homo sapiens. This invention has been made around 50,000 years ago. Instead of replacing gesture, speech and gesture “co-evolved in complex interrelationships throughout their long and changing partnership” (p.36-40)

2.2 Gesture

According to Oxford dictionary gesture is defined as “The act of moving the limbs or body as an expression of thought or emphasis.” Different scholars have their own perceptions about the different forms of gesture (Armstrong, Stockoe, & Wilcox, 1995, p.3). Tellier (2009) states that in order to define gesture, first it has to be separated them from continuous movements that occurs during everyday interactions (p.201). McNeil in *Gesture and Thought* states that the word gesture covers a range of communicative movements, but it is not always related to the hands and arms (p.79). According to Kendon (2004) gestures are “visible action when it is used as an utterance or as part of an utterance” (p.7). The main characteristic of gesture is “deliberate expressiveness” (p.15). McNeill (1992) have said that “Gestures are not just hand movements and can never be fully explained in purely kinesic terms. They are not just the arms waving in the air, but symbols that exhibits meaning in their own right” (p.105). Garber & Goldin-Meadow (2006) describes gestures as “.....an outpouring of excess energy or a bid for the listener’s attention” (p.818)

2.2.1 Kendon’s continuum

Based on Kendon’s (1988) work, which has been addressed as Kendon’s Continuum, David McNeill (1992 & 2000) elaborated it further. In this continuum David McNeill (1992) has placed different gestures accordingly on the basis of different properties, like, the presence of speech, linguistic abilities and its degree of conventionalization. According to McNeill (1992)

there are four categories in this continuum: gesticulation, pantomime, emblems and sign language. Gesticulation refers to “idiosyncratic spontaneous movements accompanied by speech”. “Pantomime” is used to mime an action, or an object, a profession, etc and is mainly used when it is impossible to speak. Emblems are gestures used in a specific community; they have a definite meaning which can vary according to different cultures. Different cultures have their own of way using certain gestures hence meaning varies as well. Example, thumbs up means OK in USA whereas in Europe is a sign of disgrace. Emblems are mainly associated with a fixed expression and can be used without speech (p.37). Sign languages are “full-fledged linguistic systems with segmentation, compositionally, a lexicon, syntax, distinctiveness, arbitrariness standards of well-formedness, and a community of users”. Sign languages are languages of its own and are mainly used without speech. Mainly, people with hearing difficulty acquire this ability to communicate (p.38).

Continuum	Gesture type			
	Gesticulation	Pantomime	Emblem	Sign language
Relation to speech	Obligatory presence	Optional Presence	No speech	No speech
Relation to linguistics properties	No linguistics properties	No linguistics properties	Some linguistics properties	Linguistics properties
Relation to conventions	Not conventionalised	Not conventionalised	Partly Conventionalized	Fully conventionalised

Table 1: Characteristics of gesture types according to “Kendon’s Continuum” (adapted from McNeill, 2000)

2.2.2 Communicative intentions of gestures

What is the motive of gestures? Different have tried to give quite a varied perceptions, yet, they all concluded that that the main motive of using gestures is communication. As communication is the main emphasis of gestures, hence it is regarded as intentional. Cochet and Vauclair (2010) have outlined the intentional natures of gestures.

1. The behavior of the signaler has to be produced and directed towards a recipient.
2. The gesture is usually accompanied by visual-orienting behaviors, including gaze alteration between the recipient and the object or event being pointed as (this visual monitoring enables the signalers to check the efficiency of the gestures, thus confirming their communicative intention).
3. The children are likely to repeat their gestures if they fail to produce the desired effect on their communicative partner (this persistence of the signal is also interpreted as a demonstration of intentionality) (p.130).

2.2.3 Gesture over speech

Why is it easier to express using gesture than speech? One prospect is that gestures (particularly pointing gestures) are easier to produce than speech. Speech depends on “complex articulation mechanisms” which require a greater mastery before using it successfully (Acredolo & Goodwyn, 1989, p.452). Gesture puts fewer demands on the working memory than speech. Speech requires “rule-governed combinations” of separate units that are codified according to the norm of the language. On the contrary gesture conveys meaning idiosyncratically by using varied forms that are related to the context on which the gesture is being used. Pointing to an object, or creating an iconic gesture about a fly to describe the action of the object, is cognitively less demanding than producing words for these ideas (Goldin-Meadow & McNeill, 1999, p.25).

2.3 Theories of communicative development

2.3.1 Piaget's cognitive development theory

Work of Piaget is seen as one of the most influential theory in the developmental psychology (Piaget, 1926, 1954, 1962). The main idea of Piaget's theory is children are active thinkers, who try to construct a better understanding of the world around them by passing through different stages known as cognitive stages (Siegler & Ellis, 1996, p. 211). This transition from one stage to another is facilitated by the child's interaction with their environment which is achieved by assimilation and accommodation (Piaget, 1954). Assimilation can be defined as the integration of the external elements with the schema that already exists in the child's brain (Block, 1982, p. 282). For example, when a child sees a zebra and calls it a horse. In this case the child has taken their pre-existing concept of a horse and relates it with the zebra. Whereas accommodation refers to change in the cognitive structures of the child and fits it with the environment appropriately (Block, 1982, p.283; Patterson, 2008).

The sensorimotor stage

The first stage, to which we have already referred, is the sensorimotor stage. It lasts from birth to about 2 years old. As the name implies, the infant uses senses and motor abilities to understand the world, beginning with reflexes and ending with complex combinations of sensorimotor skills. Between 1 and 4 months, the child works on primary circular reactions. It is just an action of its own which serves as a stimulus to which it responds with the same action, and around and around we go. For example, the baby may suck her thumb. That feels good, so she sucks some more. Or she may blow a bubble. That is interesting so she/he will do it again. Between 4 and 12 months, the infant turns to secondary circular reactions, which involve an act that extends out to the environment: She/he may squeeze a rubber duckie. It goes "quack." The

child finds it great so repeats it and does it continuously. The child is learning “procedures that make interesting things last.” At this point, other things begin to show up as well. For example, babies become ticklish, although they must be aware that someone else is tickling them or it won’t work. And they begin to develop object permanence. This is the ability to recognize that, just because you cannot see something does not mean it’s gone or not there. Children who are a bit young seem to function by an “out of sight, out of mind” schema. But older children remember, and may even try to find out things that they can no longer see. Between 12 months and 24 months, the child works on tertiary circular reactions. It consists of the same “making interesting things last” cycle, except with constant variation. The child hits the drum with the stick and there is a sound “rat-tat-tat-tat”. Again hits the block with the stick, the sound ends up as “thump-thump”. Later, the child hits the table with the stick and hears the sound “clunk-clunk”. The child hits his/her father with the stick and the father says, “ouch-ouch”. This kind of active experimentation is best seen during feeding time, when discovering new and interesting ways of throwing your spoon, dish, and food. Around one and a half, the child is clearly developing mental representation, that is, the ability to hold an image in their mind for a period beyond the immediate experience. For example, they can engage in deferred imitation, such as throwing a tantrum after seeing one an hour ago. They can use mental combinations to solve simple problems, such as putting down a toy in order to open a door. And they get good at pretending. Instead of using dollies essentially as something to sit at, suck on, or throw, now the child will sing to it, tuck it into bed, and so on (Piaget, 1962, p.9-28).

2.3.2 Vygotsky’s interactionist theory

Les Vygotsky (1978) has emphasized on the interaction approach as it serves a huge role in the development of communication. According to him language develops due to social interaction. Children proceed to a higher level of “mental functioning” (an extension in knowledge

and performance) when interaction occurs effortlessly and regularly in an environment (Fein, 1979; Lightbown & Spada, 2006, p.20). He also argued that producing gestures and speech in a variety of contexts leads to an advancement of thinking (Vygotsky, 1962, 1978, 1987). According to Vygotsky a child's development appears twice: first in the social level later on individual level. Social level is the phase where people are involved which he referred as "interpsychological", then inside the child which is, "intrapsychological" (Vygotsky, 1978, p. 56). He illustrates the development of pointing in order to clarify his point of social interaction. Initially pointing is only a simple grasping movement due to the failed reaching of an object. When the caregiver comes to help the child, the meaning of the situation changes and provokes another meaning. The failed reaching situation initiates a reaction from another person. The gesture "in itself" becomes a gesture "for others" hence, resulting in a socially meaningful communicative act (Vygotsky, 1978, p.57). A prime concept of Vygotsky is the "zone of Proximal Development (ZPD)". It is a metaphoric place" in which learner is capable of a higher level of performance because there is support from interaction with an interlocutor (Lightbown & Spada, 2006, p.206). Therefore, it is said that gesture and speech development occurs through spontaneous interaction with partners in a day to day conversational contexts.

2.3.3 Behaviourist Perspective

The term behaviourism is founded by John B. Watson (1913) based on the idea that behaviours can be measured, trained and changed. Behaviourism is primarily concerned with observable behaviour as opposed to internal events like thinking and emotion (p.158). It is a theory of learning based on the idea that behaviours are acquired through conditioning and conditioning occurs through interaction with the environment (Lightbown & Spada, 2006, p.10). According to B.F. Skinner (1948) the best way to understand behaviour is to look at the causes of an action and its consequences, which he termed as "operant conditioning" (p.170). According to this approach children imitate the language produced around them and when they receive a

“positive reinforcement” and tend to repeat the behaviour. A well organized environment will help the children to continue this process until they form “habits” of correct language use. (Lightbown & Spada, 2006, p.10). Gestures are learned through this process of behaviourism as children are not capable of using language at the beginning due to the lack of gross motor skills. Parents point pretty early to communicate with their children. It is a primary means of communication with the children. When the child understands this they start to imitate their parents till they grasp the correct form of the gesture. While learning to imitate the gestural behaviours parents smooth their progress by providing positive reinforcement. Imitation and learning is also related to “zone of proximal development”. If the parents and caregivers provide an advanced gesture or language, children cannot acquire those even if it is repeated several times. Children can only imitate and adopt if the activity is within the boundary of the child’s particular “zone of development”. (Lindbom & Ziemke, p.3).

2.4 Co-speech gestures or Illustrators

Co-speech gestures are an integral part of communication as they are tightly linked with to speech semantically, pragmatically and temporally (Kendon 1980, 2000, 2004; McNeill 1985, 1992). A variety of theories have been developed which attribute different functions to co-speech gestures. Some of these claim that co-speech gestures facilitate speakers’ cognitive processes during speech production, such as conceptualization or lexical retrieval (Holler & Wilkin 2011, p.135). Co-speech gestures are also known as illustrators as described by Ekman and Friesen (1974). According to them “illustrators are movements directly related to speech”. It illustrates what is being said verbally in a moment-to-moment basis. It is more like trying to show the picture of the words with the help of the hands. Children use gestures at a very young age like 10 months, but speech emerges slowly and develops gradually (p.211).

2.4.1 Imagistic and Non-imagistic gestures

David McNeill (1985, 1992, 1998, 2000, 2005) has further distinguished co-speech gestures or illustrators into two types: “imagistic” and “non-imagistic”. “Imagistic” gestures are those that portray or provide an image of an element of the speech. For instance, a child may say “I am driving a car” and he/she may represent the action holding a steering wheel while saying “drive”. Also, when denoting the idea of “big house” the child may show a width with both hands open while saying the word “big”. Imagistic gestures are broken into two main parts; iconic and metaphorical gestures. On the other hand, “non-imagistic gestures” are those related to “pointing to tangible environment” or “mark out some segments of discourse”. For example, while watching a bird flying in the sky a child may point at it immediately. Further sub-division are there for non-imagistic gestures; deictic or pointing gestures and beat gestures

2.4.1.1 Iconic gestures

This class of hand movements was first introduced by Efron (1941/1972) who called them “physiographic gestures”. It starts approximately at 2 years of age with the ontogenesis of multi word speech. Peirce (1965) describes it as, “an icon is a representamen which fulfills the function of a representamen by virtue of a character which it possesses in itself, and would possess just the same though its object did not exist” (p.573). An iconic movement or hand posture thus represent the meaning of an object purely by “existence”, rather than by shared cultural background or social agreement. However, misconception should not be created that, iconicity always portrays a perfect image using the same gesture shape. Differences are seen between children/individuals in creating similarity of an object, different limbs or body parts can be used to express the same object iconically. Feyereisen and de Lannoy (1991) point out that iconicity may “not relate to the relationship between the sign and its referent but to the

relationship between the sign and its ground”, that is “the aspect, by which the sign evokes the referent” (p. 11). Iconic gestures form a “signifier-signified pair”, so that one cannot be understood without the other (Saussure, 1969) (Investigating). “The signifier part is formed to present the image of the signified part” (McNeill, 1992, p.354). Iconic gestures bear a close formal relationship to the “semantic content of speech” (McNeill, 1992, p.354).

2.4.1.1.1 Types of iconic gestures

Stephens and Tuite (1983) proposed a subdivision of the iconic gestures according to the usage of the hands, body parts etc regarding the object manipulation; “iconix1” and “iconix2”. The gesture types progress from iconix1 to iconix2. In iconix1 the hands recreate and manipulate a virtual object, for example, the driving example that is given earlier, in order to portray the image of driving the child imagines holding a steering wheel. In this situation the hands are held apart as if the child is holding onto the steering. The gesture recreates and manipulates the discourse, which is the hand plays the part of the hand. In iconix2, the hands work more abstractly to show an entity. For example, in order to depict the idea of [go inside the building], the gesture could be [left hand encircles the right hand space, then right hand slides down left]. The gesture shows that an object being entered but it does not depict hand. It is said that children uses “iconix1” first and then moves to “iconix2” at a much later stage. The iconic gestures of the children are less flexible. Therefore, when a child uses his/her hand he/she is actually playing the role of the characters hand only. This gives us the reference of iconix1 developing earlier in children. If they have to play parts of something else additional movements of the body parts occur in order to show the character whose act is being described. Children’s iconic gestures are more detailed and less abstract as they acquire the ability of abstract object much later (as cited in McNeill, 1992, p. 356-365).

2.4.1.2 Metaphoric gestures

Metaphoric gestures are quite similar to iconic gestures as they depict the abstract idea of a concept rather than a concrete object. Metaphoric gestures are similar to the abstract meaning of the sentence. This type of gesture “exhibits meaning relevant to the concurrent linguistic meaning”. But, the relation to this meaning is not direct. Metaphoric gesture portrays image of abstract objects. Metaphoric gestures are independently motivated on the basis of cultural and linguistic knowledge. Metaphoric gestures that are produced along with speech thus depict the information about the culture, beliefs and attitudes. Example, rolling the index finger to denote start all over again. Therefore, metaphoric gestures have to be closely related to speech to understand the gesture and context on which it is used. Children have difficulty in using metaphoric gestures as it represents abstract idea. Children’s abstract develops at a much later stage so the usages of this gesture are very low or not used at all (McNeill, 1985, p. 356).

2.4.1.3 Deictic or pointing gestures

Deictic or pointing gestures are mainly done to point at objects, events or people. Children start using pointing gestures at the age of 10 months (Camaoni et al, 2004, p.293). Pointing gestures help to facilitate the predictive relationship of gesture and speech; as it shares a common ground with speech enabling the children to communicate with adults about their intentions, requests and feeling. (Pizzuto & Capobiamco, 2005, p.185). Pointing gestures help children to interact with adults. It is an ability to direct the adult’s attention to outside entities in “triadic interactions” (Liszkowski, 2005, p.140; Tomasello et al, 2007, p.708). Children convey their intentions, requests and feelings about a specific referent and also about the circumstances in which the gestures are used (Tomasello, Carpenter, & Liszkowski, 2007). Vygotsky (1988) has claimed that pointing gestures have developed due to the failure of reaching an object (p.65).

Whereas, Delgado, Gomez & Sarria (2009) has regarded pointing gestures are regarded as “private gestures”, whose role is to control infant’s attention instead of communicating with the recipient (p.156). Production of pointing gesture requires a shared experience between the signaler and the recipient with the external referent which is addressed as “joint attention” (Carpenter, Nagell, & Tomasello, 1998, p.55). Whereas a contradictory view has also been established stating that children’s early pointing is intended to gain positive emotional reactions to self than directing the attention of others to external entities. (Moore & Corkum, 1994, p. 365; Moore & D’Entremont, 2001, p. 115; Racine & Carpendae, 2007, p.33).

2.4.1.3.1 Types of pointing gestures

Based on the different intentions of pointing classification have been made about the functions of pointing gestures, which can also be attributed as the communicative acts of pointing gestures; “proto-imperative” and “proto-declarative” functions. “Proto-imperative” is defined as the “use of the adult as a means to a desired object” and “proto-declarative” is defined as the “use of an object as the means to obtaining adult attention” (Bates, Camaioni & Volterra, 1975, p. 209). Both these gestures were initially described as “instrumental acts towards some physical or social goal” (Cochet & Vauclair 2010, p.432).

Vygotsky (1988) have explained imperative gestures as reaching gestures. For example, imagine what a child does when he/she wants his/her parents to give him/her a biscuit that is out of their reach. The child starts doing an action to reach it. The mother understands the child’s intention and gives him/her the biscuit. By this way the child understands the relation of their action and the effects of their action on adults. Tomasello and Call (1997) has given this process a name “ontogenetic ritualization”, as the reaching action ends up being “progressively ritualized into a social and communicative gesture” depending on the adult’s reaction to the specific action.

Declarative gestures can be illustrated as following. For instance, when a child sees a cat in the garden and discovers that his/her mother has not seen it, what will the child do then? Instead of reaching towards that cat the child will try to draw his/her mother's attention and carve up the enthusiasm. In order to communicate in this situation the child sinks into his/her "gestural repertoire" which is already stored in the memory. This "gestural repertoire" is built by observing the parents when they (parents). As in previous declarative situations, the child has seen that his/her parents tried to gain the child's attention towards an external referent by performing a pointing gesture using their (parents) index finger. Development of declarative gestures has a strong connection with imitation (Cochet & Vauclair, 2010, p.432). According to some researchers declarative gestures reveal the child's psychological understanding of others mental states (Pika, 2008; Tomasello, 1995). Firstly, a child can use this gesture to direct the adults' or the addresses' attention to a referent other than achieving their desired goals. For instance, a child points to the plane so that his/her parents can see it as well and share the enthusiasm. This can be classified as "declarative expressive gestures" (Pika, 2008; Tomasello, 1995). Declarative pointing thus shows children understand that adults are "attentional and intentional agents" (Liszkowski et al, 2004, p.300; Liszkowski, Carpenter, & Tomasello, 2007, p.5). Secondly, the child cooperates with the adults by giving the information they (adult's) need. This is known as "declarative informative" (Liszkowski et al, 2006, p.178). It is quite difficult to distinguish between declarative expressive and informative gestures as it is completely dependent on parents to understand the child's intention.

2.4.1.3.2 Hand shapes

Hand shapes that children use during imperative and declarative pointing gestures draw a clear variety between these two types of pointing gestures. Using of different hand shapes

portrays the different functions of pointing gestures more vividly. According to Brooks & Meltzoff (2008) imperative gestures are related to attaining a desired object using adults as a medium so whole hand with an open palm is used to denote the notion. During imperative gestures a child wants an object; in order to grab that desired object the child extends his/ her hand with an open palm and is very prominent during these situations (p.207-220). Tomasello et al., (2007) has stated that, by contrast, during declarative expressive and informative gestures the use of index finger is seen. Declarative expressive gestures draw adult's attention towards an outside object. So, to do that index finger pointing is seen frequently. In case of declarative informative gestures the child uses index finger to provide the information that he/she needs (p. 710-718).

2.4.1.4 Beat gestures

Beat gestures may carry no meaning at all. Speakers frequently make simple motions with the hand or fingers, often repeated, and timed with certain peaks in speech. The cognitive and communicative functions of beats are not well understood. Children find it difficult because this of gestures are used to add emphasis to ideas expressed in speech, others to serve discourse functions, and others to reveal the speaker's emotional state: Fast, staccato beats may show agitation; precise beats can show determination or sincerity; large, forceful beats may show either frustration or enthusiasm. The significance of beats can only be interpreted in the context of the gesturer's language, posture, or facial expressions. This type of gesture is difficult for the children to produce. An example of a beat gesture is "the party starts at three or four" accompanied by a finger flicking up at the word three, and flicking down at the word four. This type of gestures add an emphasis on a verbal notion to grab attention or be more concerned about it (Cassell et al., 2004, p.479-481)

2.5 Joint attention

Up until around nine months of age, children interact with objects and people in their environment through *dyadic* interactions. However, by around nine months of age, children are able to coordinate a *triadic* attentional frame between themselves, an object and a communicative partner (Tomasello, 1999; Tomasello & Rakoczy, 2003). This helps to reliably look where the caregivers look (Scaife & Bruner, 1975; Senju & Csibra, 2008). The child uses the adult as social reference hence the establishment of joint attention takes place (Vaish & Striano, 2004, p.264). Joint attention skills address the ability to manage attention with a social partner in order to relate to an object or event of interest (Mundy & Acra, 2006, p. 300). Children may represent object through gestures in order to attain joint attention thus enhancing the communication through joint attention (Carpendale & Lewis, 2004, p.100). There have been two main types of joint attention behavior shown by children. The first has been termed “responding to joint attention (RJA)” and it occurs when a child is able to monitor and follow the gaze or gestures of another person. This occurs at a very young age, 6 months (J. A. Hobson & Hobson, 2007, p.415). The second form of joint attention which occurs later is called “initiating joint attention (IJA)”, and it starts when the child learns to use gestures, eye gazes etc. (Carpenter, Pennington, & Rogers, 2002, p.98). Bruner (1975a, 1975b, 1983) argued that the development of joint attention is the foundation of all succeeding social interactions and cultural learning (Carpenter, Nagell, Tomasello, et al., 1998. p.117). According to Rogoff (1990) it is children’s joint attentional abilities that mark the beginning of their understanding of the symbolic artifacts (e.g., words, signs or gestures that others use). “Collaborative knowledge” makes joint attention different from simple gaze as two people experiences the same event at the same time. This is more than merely experiencing the event at the same time because it allows two people to share

common ground, which allows collaborative communication and shared goals (Tomasello, 1995; Tomasello & Carpenter, 2007).

2.6 Factors associated with gesture

There are some “regular and consistent circumstances” related to the incidence of a gesture or gestural act. Ekman & Friesen (1969) elaborated some aspects associated with the usage of gestures. Those are mentioned below.

2.6.1 External condition: It refers to the environmental situation which “customarily coincides with, inhibit or occasion an act, or qualify its (gesture) meaning”. Setting is one such external occasion; for example, the gestural act could be customary that is it can be customized in different places, i.e. home, dyadic or group interactions. Children’s use of gesture in relation to different situations may vary. Along with the emotional tone related to the interaction may vary according to event of an act; e.g. angry, formal, warm in particular with the relationship between the interactants. Children may not have quite a number of varieties of emotional tone.

2.6.2 Relationship to verbal behaviour: It depicts the idea of the relation with the verbal behaviours i.e. speech. The verbal behaviour may coincide with the gestures produced or contradict the words. Unlike adult gestures children’s gesture are comparatively less complex and has lesser variety. The verbal behaviour or the words associated with the gestures possess less variation as well. Verbal behaviour may be unrelated to the gestures produced along with it.

2.6.3 Awareness: It can be also be termed as “internal feedback”. This criterion denotes whether the performer is aware of the fact that he/she is engaged in a gestural act and is able to recollect what he/she has done.

2.6.4 Intentionality: Intentionality refers to the use gestures to communicate a message to another interactant. The definition provided does not include behaviour which is considered as “unconsciously intended”. Intentional gestural behaviour must be within the awareness and the sender must want to send a message through the gestural act.

2.6.5 External feedback: The feedback from the receiver or the observer that is conveyed to the sender of gesticulation. Such feedback may include direct verbal act, a combination of gestural-speech act or gestures alone. In giving the feedback to the children (sender of the gestures) they are facilitated through this approach and enter the network of communicative acts. Further more, while sending the external feedback to the sender the observer (the receiver) proves that the gestural act is being perceived and evaluated (p.53).

2.7 Speech

Probably the most obvious examples of intentional communication are words. Indeed, theorists have been long interested in the apparently unique capacity for humans to use words in contrast to non-human primates. When one uses the word “dog” the physical characteristics of the word i.e. its sound and form have no resemblance to what it represents (i.e. a furry animal with a tail). The meaning of this verbal word is derived from an understanding of the convention, and thus the intention of the person who used that symbol to represent something (Herrmann et al. 2007, p.1362). Saussure (1969) first attempted to determine the “signifier-signified” relation between a word and what it represents. He reasoned that a word i.e. the signifier was closely related to idea, object or event that it signified. If one of the two planes is not related to each other then the word itself would lose all meaning. Therefore, there is a close association of these modalities, gesture and speech. Once these are integrated, it makes communication effortless and quicker for the recipient to perceive the information.

2.7.1 Relationship of gesture and speech

How gesture is related to speech is not fully understood till now. Different scholars have given competing hypothesis regarding this relationship. Three competing hypothesis of recent times are mentioned in this literature. The first hypothesis states that “gesture and speech are autonomous and separate communication system” (Butterworth and Beattie, 1978; Hadar, 1989; Hadar *et al.*, 1998; Levelt *et al.*, 1985). This hypothesis regards gesture and speech as “independent systems” (Jaques & Mayberry, p.201). According to this system, gesture functions as an “auxiliary system” whose primary role is to reimburse speech when “vocal expressions” are interrupted due to certain hindrances like, coughing, mouth full of food or lack of words to express thoughts (Jaques & Mayberry, p.201; Iverson & Thelen, p.20). Therefore, according to Iverson & Thelen, “[.....] it is assumed that production of speech have no effect on the production of speech or the cognitive processes that guide it” (p.20).

The second view is of Krauss et al. (1998), he has argued that there is an “....existence in reciprocal links between speech and gesture” (as cited in Iverson & Thelen, p.23). This links are located at the “.....specific point of in the process of speech production” that is “phonological encoding stage” or at the moment when a “form must be retrieved from the lexical memory”. When a speaker faces difficulty during word retrieval, gestures emerge activating the “spatio-dynamic” features of the form in the memory. The lexical connection along with “spatio-dynamic” concept in the memory of the word helps in the successful articulation of the word with the help of gesture. “[Gesture] provides a cross- modal activation of the concept at a moment of difficulty in word form retrieval.” (Iverson & Thelen, p.20).

The third view has been stated by David McNill (1992), that, gesture-speech form an “integrated-system framework”. According to his view gesture and speech form a single

communication system which as a common thought process involved in both modalities. Gesture and speech will always be “co-expressed” (Jaques & Mayberry, p.21) Gesture is linked to the structure, meaning and timing of spoken language “occurring at the levels of discourse, syntax, semantics, and prosody”. Any disturbance in the production of speech will have an effect in the production of gesture, or vice versa (Iverson & Thelen, p.21).

2.7.2 The one word stage

Infants may utter their first word as early as 9 months. This stage is characterized by the production of actual speech. Often the words are simplified and mainly words are shortened. When the child has acquired about 50 words h/she develops regular pronunciation patterns. This may even distort certain words-- turtle becomes "kurka". Incorrect pronunciations are systematic at this time, for example words with /r/ are pronounced as /l/. At this stage the children's vocabulary is small so when they learn one word they tend to forget another. The first words tend to be the names of important persons, foods, greetings etc. This stage lasts nearly till 2 years of age before the children begins to use two-word utterances (Cruttenden ,1979, p.13).

2.7.3 Natural Partition hypothesis

According to Gentner et al. (1982) it is often said that children's first words are primarily nouns. It is also said that the contents accessible to infants are primarily nouns. They are different from and conceptually more basic than verbs or prepositions. The Natural Partition Hypothesis states that the linguistic difference between nouns and predicative terms such as verbs and prepositions, is based on a “preexisting perceptual concepts such as persons or things and predicative concepts of activity, change-of-state, or casual relations; noun is basically much simpler and basic than verbs and other predicates. An infant has two streams of information while learning a language the “perceptual-cognitive information” about the world around and the

stream of language being spoken (p.9-12). Children have to match up the concept with part of speech stream. The idea of an object is easy learned than the action of the object as the object is visible in front of the children. Whereas the idea about the action of the object is not visible therefore it takes a bit longer for the child to get familiar with the action. Macnamara (1972) proposes that the cognitive difficulty predicts the order of acquisition of different kinds of word meanings with object reference as the simplest meaning. He predicted an order of acquisition: name of entities, names for actions and names for permanent attributes. He states that the early communicative gesture of children is pointing. So, when a child first points they acquire the name of the object rather than the action of it. Verbs are learned much later. The gesture associated with verbs is mainly iconic, as iconic gesture denotes action of an object (as cited in Gentner et al., 1982, p.14)

2.7.4 Types of gesture-speech combination

During this one word stage the children produce one word at a time. They produce words that are related to location, objects, people also words related to actions and properties are there in there vocabulary (Nelson, 1973). At the earliest stage children fail to combine words with gestures. They use deictic gestures to point out objects, people and iconic or representational gestures to convey information as early as 10 months. The reason behind is children able to combine gestures with meaningless vocalizations due to which they ignore the fact of combining words with gestures. Later, as the age proceeds children acquire the ability to combine gesture and speech which is a significant development in child's communication (Butcher & Goldin-Meadow, 2000, p.32). Children combine gestures with words several months earlier than they combine words with words. Before the two-word utterances a child can point to a cup and say the word "cup" or say the word "mummy" (Greenfield & Smith, 1976, p.24). The purpose of

combining gesture with words is to facilitate communication. According to the communicative act there are three categories.

1. **Only gestures:** This denotes the idea of producing gestures without speech. The gestures can be presented singly i.e. point to a dog or a combination of gestures can be produced, e.g, pointing to a dog and pointing to a cookie.
2. **Only speech:** Speech only acts are words produced without gesture, only a single word is produced i.e. egg or a two or more words are combined to produce the desired effect, e.g. mummy cat.
3. **Combination of gesture and speech:** These are acts which contain both gesture and speech e.g. a child can point to a car and say car. Gesture and speech combination has been further categorized into three types based on the information conveyed in gesture and speech.
 - a. **Reinforcing relation:** This refers that the gesture conveyed the same information as the speech, e.g. the child says “cup” and along with it holds the cup.
 - b. **Disambiguating relation:** Disambiguating relation of gesture and speech is when gesture clarifies the referent of a pronominal e.g. the child may say “her” and point to his/her sister. It can be demonstrative e.g. a child shows an object and utters “that”.
 - c. **Supplementary relation:** Supplementary gestures add semantic information to the message conveyed in the speech e.g. the child points a glass full of water and says drink. Supplementary gesture-speech combination can be further divided into three categories
 - **Argument + argument:** The child points to an object and addresses to a referent so that he/she can receive the desired effect. e.g. “mommy+ points to a couch”

- **Predicate + argument:** This portrays the idea that child refers an action either through the speech or gesture and the object is shown either through speech or gesture. For instance “You+ driving is portrayed with help of an iconic gesture”, “Eat+ the cookies are hold up” etc.
- **Predicate + predicate:** This supplementary gesture + speech combination deals with predicates. The speech uttered will be a predicate and the gesture will denote the action e.g. “Eat + putting the finger inside the mouth”. (Ozcaliskan & Goldin-Meadow, 2010, p. 3-4)

Chapter 3: Research Methodology

3.1 Participants

- a. Children: In this research, there were total 20 children. The researcher observed them in day care centres where these children stayed from 9pm to 5 pm. There were 10 children with the mean age of 14.1 months. Out of these 10 children 6 were girls and 4 were boys. The next 10 children had a mean age of 18 months. Out of these 10 children 5 were boys and 5 were girls.
- b. Parents: All the parents who were interviewed during the research were the parents of the children who were observed. This was done so that a vivid idea about the children who were observed could be perceived. The parents were interviewed because it's them who knew their children the best. In total there were 20 parents. Both the father and mother worked due to which they had to send their children to day cares. The socio-economic condition of all the parents was similar. These became an additional advantage to study as the children they came from the same background type. Also, as the parents were educated it facilitated the interview. Mothers were mainly interviewed as it is believed that mothers share a strong emotional attachment with the children.

3.2 Instruments

- a. **Interview for parents:** 20 parents were interviewed. There were 9 questions in the interview. The parents had to explain their point with proper justification in order to make the answers clear.
- b. **Questionnaire for parents:** 20 parents were given a questionnaire which had 12 questions. They had to tick the options yes, no or no comment. One question had options like always, sometimes or no comments.

- c. Observation of children:** During the observation, altogether 20 children were observed for 60 minutes each, in day care centres. The children were observed during their normal play session or while communicating with their peers and caregivers. The setting in which the children were observed was normal. The rooms were previously filled with toys and colourful paintings to make the children comfortable and lively.

3.3 Method of analysis

Mixed and triangulation methods were used to find out about the gestures and their usage along with integration of speech of the children. Interviews, questionnaire and observation were done for the research. Parents were interviewed along with a questionnaire was given and children were observed for the research. The answer of the questionnaire was converted to percentage. The pie charts and bar graphs were created using Microsoft Excel 2007 © is used. The method of analysis of the observation is written below.

Chapter 4: Research Findings and Discussion

4.1 Analysis of parents' interview

For parents' interview, there were 9 questions which were asked to 20 parents. The parents were asked to explain the answers briefly.

Question 1

What type of communicative method do your children prefer? Only gesture, only speech, combination of gesture and speech or a mixture of all these?

Parents of 14 months: According to all the parents, their children produce a mixture of all these methods. Yet, they said that there is a variety in using these gestures. 8 parents said that their children mostly produce a combination of gesture and speech. Also other types like only gesture, only speech is also produced depending on the situation their children are in. This proves the idea of David McNeill (1992) that gesture and speech form a single communication system and will always be "co-expressed". Also, only gestures and only speech are produced in different situations. 2 parents said that their children mainly produces only gesture first but speech do accompany later.

Parents of 18 months: Parents of 18 months have the same answer like that of the parents 14 months old. They said, their children are more comfortable in using the gesture and speech combination as the children had to put less effort. The children can easily use gesture and describe the action in speech. 9 parents agreed that their children use gesture and speech spontaneously but only speech and only gesture are also used depending on the situation their children are in. 1 parent said that her child uses speech more frequently. Also, gesture and speech combinations are used. As the children are 18 months they use quite a more number of the above mentioned combinations than that of the children of 14 months.

Question 2**How did your child learn the gestures?**

Parents of 14 months: All the parents agree that their children learned the gestures by observing them. At a very early age they tried to communicate with their children with gestures accompanying speech. They tried to grab the attention of their children by pointing to different objects or imitating the action of different objects. Gradually their children started to learn the gestures by observing them.

Parents of 18 months: The parents of 18 months have given similar answer like that of the parents 14 months. Their children learned the gestures by observing them and the people around who tried to communicate with them. They grasped the gesture from those situations and learned those for further usage in the future. B.F. Skinner's, behaviourist theory applies in this condition. According to him children learn from the environment around him/her and imitate the action that is being used to communicate with them. Like speech learning of gesture is no exception.

Question 3**Why do you think your child use gestures?**

Parents of 14 months: All the parents agree that their children use gesture mostly to communicate with them in different situations. Yet 3 parents have provided an interesting idea, they said that their children use gesture for their (children's) own other than communicating with them. They talk with themselves as if they are visualizing a completely different world for them. While talking the children produce gestures for those situations. Les Vygotsky's social interaction assembles with the answer that is provided by the parents. Gestures are used for social interaction.

Parents of 18 months: The parents of 18 months states that their children use gestures to communicate with them. They use different gestures to grab their attention. The same phenomenon of talking to self using is elaborated by these parents as well. According to them their children produce a virtual world so that they can talk in which they use gestures according to their own interest.

Question 4

Why does your child use pointing gestures?

Parents of 14 months: All the parents states that their children produce pointing gestures to obtain an object or to show something to them. According to the parents they think that there children mainly point because they want something which is out of their reach. In order to gain that object the children needs their help. Also when they see a new object they point towards that in order to show it to them but these happens less frequently compared to obtaining an object. Bates et al. has described pointing gestures as an “instrumental act towards some physical or social goal”. The “proto-imperative” function of pointing is vivid in this answer. 1 parent gave an interesting view, when her child points she wants to get a positive reaction from them like clapping. This is similar to the “reinforcement” that the behaviourist perspective of B.F.Skinner depicts.

Parents of 18 months: According to these parents their children mainly point to show something to them. When they see a new object they instantly point at it to show it to their parents. Also failed reaching of an object evokes pointing gestures as said by the parents. This type of gesture is called “declarative pointing gestures” as described earlier. When the children see a new object they sinks into their “gestural repertoire” which is already stored in their memory (Cochet & Vauclair, 2010).

Question 5

If your child does not get the desired result that he/she is expecting after performing a gesture what does he/she do?

Parents of 14 months: All the parents have the same opinion that their children becomes angry and tend to repeat the same gesture until the parents perform the desired effect that the child is expecting. The child tends to repeat the gesture. According to Tomasello and Call (1997) this process is called “ontogenetic ritualization”. Previously the child understood the effect of using the gestures so the child while perform the gesture until she/he gets the desired result that he/she got in the previous situations.

Parents of 18 months: The parents have given similar answers like that of the parents of the 14 months. This shows that the child wants to engage into a social and communicative act as stated by Tomasello and Call (1997). Les Vygotsky’s interactionist theory is portrayed in this situation. Wanting to have the desired effect is part of social interaction. The child demands the appropriate feedback which shows that the child is aware of the “interpsychological” phase where people are involved for social communication.

Question 6

How do your child responses through their gesture when the external condition changes, (home, outside)?

Parents of 14 months: 6 parents said that their child points more when they are outside. 4 of the parents stated that there is not much of a difference, yet their child do point a bit more when they are exposed to the outer world. 1 parent gave an example, when her child came home after a visit from outside she started to use gestures that represented a cow and started to make sounds that resembles the sound of that of a cow.

Parents of 18 months: 8 parents have agreed that their child uses more gestures when they are outside. They said that their children point more when they are outside. They want to grab things which they find new. Hence in order to attract their parents they point. Their children imitate actions that they like. According to them it is seen that their children use those representations of object when they come home. 1 parent gave an example, her child started to imitate a carrier of a candyfloss which she has seen outside. So when she came home she started to imitate the action to represent the situation. Les Vygotsky's (1978) idea of "zone of proximal development" is portrayed in this situation. A child is capable of performing a higher level of performance if they are exposed to the correct situation. 2 of the parents said due to shyness their children do not use much of the gestures outside. Then again this denotes a change. Ekman & Friesen (1969) came up with this view that child's gesture vary according to different situations.

Question 7

Which joint attentional framework does your child prefer- "responding to joint attention", "initiating joint attention"?

Parents of 14 months: All the parents said that their child uses both. Yet when their children are asked to do something they are more reliable and do the action immediately. For instance a parent gave an example, if her child is asked to show a star "tara" they blink their hands and respond to them. At the same time by showing different actions they try to initiate joint attention with them. For example a parent said, her child uses her finger to show the image of a brush and gain her (mother's) attention. This matches with the idea of Efron's (1972) idea of "iconix1" where the children use his/her body parts to show an action.

Parents of 18 months: All the parents have stated that their child prefers both. Their child tries to initiate joint attentions. Also, they respond to joint attention as well. When they are asked to

show something they do it nicely. While initiating joint attention they (children) try to gain their (parents) attention. In doing so, the parents and the children experience the same event at the same time. Through joint attention the parents and the children share a common ground which shows their “collaborative knowledge” and share a goal as stated by Tomasello & Carpenter (2007).

Question 8

What types of word do your child uses while pointing, (nouns, verbs)?

Parents of 14 months: According to the parents, their child uses mainly nouns while using pointing gestures. It is not always the case that their child points all the time or they use words all the time. While they use words along with pointing gestures they use nouns. According to the “Natural Partition hypothesis” nouns are basically simpler than other forms. Children use nouns because “perceptual cognitive information” around them and the word that are being spoken to children by their parents are nouns.

Parents of 18 months: The parents said that while pointing their children uses mainly nouns as through pointing they want an object or try to show an object. Some parents have stated that at certain times they do use verbs. A parent gave an example, her child points to an object and at certain times asks her to give it say “dao” (give). Dedre et al. (1982) at this age the children gets the idea of an action yet verbs are used less frequently. Children need time to grasp the idea of verb.

Question 9

What types of word your child uses along with iconic/representational gestures (nouns, verbs)?

Parents of 14 months: Parents of 14 months said that their child uses nouns along with representational/iconic gestures. When their child use iconic/representational gestures they say try to say the name of the object. For instance, a parent said when her child tries to denote drinking from a glass of water he says “mum” (water).

Parents of 18 months: Parents of 18 months said that their children use both nouns and verbs. For example, a parent said when her child tries to represent riding/driving a cycle he says “vovo”, which is the sound of a cycle. Here, it is seen that actions of the objects are also portrayed through representational/iconic gestures. Another parent gave an example, when her child portrays a bird with her (child’s) arms wide open and flapping, she says bird. This shows that as age proceeds children try to use different types of words along with the gestures.

4.2 Analysis of the questionnaire

The questionnaire was given to all the parents to answer it. The questionnaire had 12 questions.

Question 1

Do you think that gesture is only produced because your child is unable to say a word due to the hindrance like coughing, mouth full of food etc?

Table 1

Answer type	No. of parents		Percentages (%)	
	Parents of 14 months	Parents of 18 months	Parents of 14 months	Parents of 18 months
Yes	0	0	0	0
No	10	10	100%	100%
No comment	0	0	0	0

In this case it is seen that parents feel that gestures are not produced due to the hindrance in speech. This notion contradicts the view of Butterworth and Beattie (1978), Hadar (1989) and Levelt (1985). According to their perspective gesture and speech are autonomous and separate communication system. Gestures are not produced just to support speech while a barrier is created.

Question 2

Do you think that gesture is produced because your child is unable to retrieve a word from his/her memory?

Table 2

Answer type	No. of parents		Percentages (%)	
	Parents of 14 months	Parents of 18 months	Parents of 14 months	Parents of 18 months
Yes	8	9	80%	90%
No	2	1	20%	10%
No comment	0	0	0	0

Children use gesture to communicate. As they are young they lack vocabulary to express a certain idea. Therefore, 80% parents of 14 months old and 90% parents of 18 months old feel that children produce gesture because they lack to retrieve the word from their memory. This supports the idea of Krauss et al. (1998) as he has stated that gestures are produced due to the lack of word retrieval so that children can communicate. 20% parents of 14 months and 10% parents of 18 months old said no.

Question 3

Do you think that gesture and speech are an integrated system that helps your child to express better?

Table 3

Answer type	No. of parents		Percentages (%)	
	Parents of 14 months	Parents of 18 months	Parents of 14 months	Parents of 18 months
Yes	10	10	100%	100%
No	0	0	0	0
No comment	0	0	0	0

The integration of gesture and speech helps the child to communicate better as they can express themselves in both the modalities which facilitates the communication. David McNeill (1992) has proposed this idea and it is seen that all the parents believe in this point. He also believes that gesture-speech should always be co-expressed at different levels of discourse making communication easier for the children. The percentage of parents of 14 months old and 18 months old is 100%.

Question 4

Does your child produce iconic/representational gestures?

Table 4

Answer type	No. of parents		Percentages (%)	
	Parents of 14 months	Parents of 18 months	Parents of 14 months	Parents of 18 months

Yes	8	9	80%	90%
No	2	1	20%	10%
No comment	0	0	0	0

Iconic gestures are regarded as a difficult gesture. It takes time to internalize this gesture type and use it spontaneously. Children at a young age find it difficult to produce this gesture but as they grow up it becomes easy for them to use. Efron (1972) said that proper representational/ iconic gestures emerge at near two years of age but at an early age children do try to represent objects. Although the image that is created may not be a perfect image but it does give the idea. 80% parents of 14 months old said that their children do produce representational/iconic gesture and 90% parents of 18 months old said their children do produce iconic gestures.

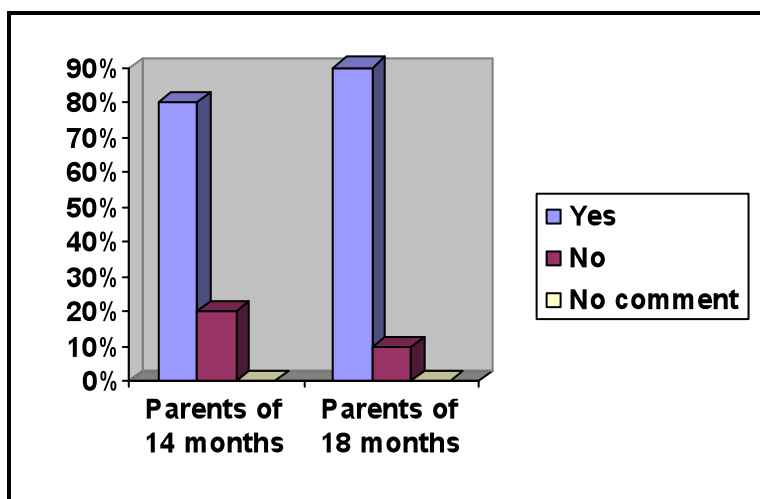


Fig 1: Does your child produce iconic/representational gestures?

Question 5

Does your child uses his/her body parts as an object to create the image of a virtual object?

Table 5

	No. of parents	Percentages (%)
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Answer type	Parents of 14 months	Parents of 18 months	Parents of 14 months	Parents of 18 months
Yes	8	10	20%	100%
No	2	0	80%	0
No comment	0	0	0	0

Using body parts as an object to portray a virtual object is common among the children. But this develops gradually. 80% parents of 14 months old said that their child do use their body to represent a virtual object. Whereas, all the parents of 18 months agreed to the point that their child uses their body parts to represent a virtual image. Stephens and Tuites (1983) proposition about the using of body parts is stated here. “Iconix1” which denotes the idea of using the body parts to represent a virtual image is seen among the child of 18 months old.

Question 6

Do you think that representational/iconic gesture is always directed to you?

Table 6

Answer type	No. of parents		Percentages (%)	
	Parents of 14 months	Parents of 18 months	Parents of 14 months	Parents of 18 months
Always	0	0	0	0
Sometimes	10	10	100%	100%
No comment	0	0	0	0

The parents agreed that the representational gesture that is created by their child is not directed to them all the time. The parents of both the age group agreed. This shows that the child produced gestures for their own self at certain times.

Question 7

Does your child produce metaphorical gestures?

Table 7

Answer type	No. of parents		Percentages (%)	
	Parents of 14 months	Parents of 18 months	Parents of 14 months	Parents of 18 months
Yes	1	1	10%	10%
No	9	9	90%	90%
No comment	0	0	0	0

Metaphoric gestures are difficult to produce as this gesture depicts an idea metaphorically. 90% of the parents of both age group said that their children do not produce metaphoric gestures. Only 10% said that their children do produce metaphoric gestures. Piaget's cognitive theory proves this notion. Children at a very young age do not possess the idea of abstract or metaphoric beings. These ideas develop at a much later stage.

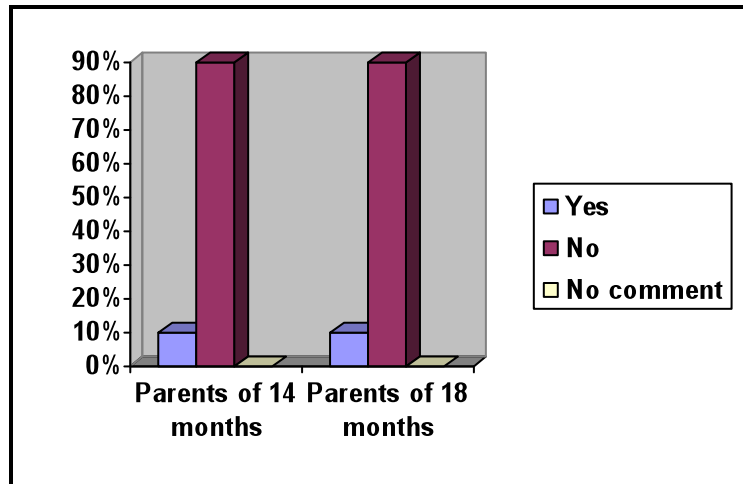


Fig 2: Does your child produce metaphorical gestures?

Question 8

Does your child produce pointing gestures?

Table 8

Answer type	No. of parents		Percentages (%)	
	Parents of 14 months	Parents of 18 months	Parents of 14 months	Parents of 18 months
Yes	10	10	100%	100%
No	0	0	0	0
No comment	0	0	0	0

All the parents agreed that their child produces pointing gestures. Pointing gestures are one of the earliest methods of communicating before proper speech emerges. The percentage of parents who agreed to the answer is 100%. Parents of both the age groups agreed with this view unconditionally. According to Buuterworth & Morissette (1996) pointing gestures emerge at the

age of 11 months. Pointing gestures help to facilitate communication as it is easy to use. Therefore the parents’ agreement about the usage of pointing gestures illustrates the idea further.

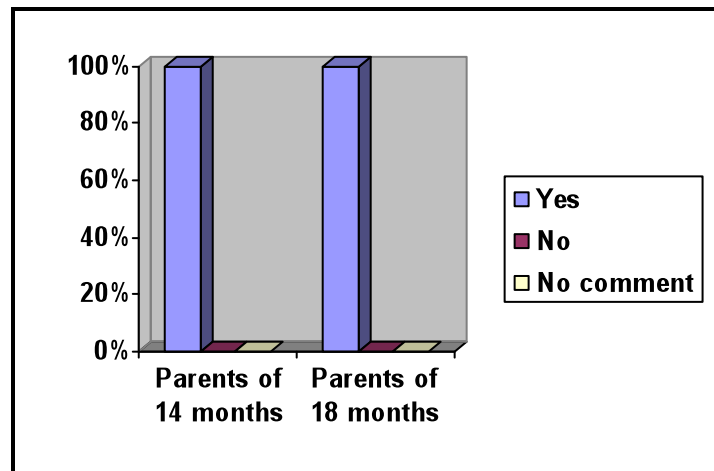


Fig 3: Does your child produce pointing gestures?

Question 9

Does your child produce beat gestures?

Table 9

Answer type	No. of parents		Percentages (%)	
	Parents of 14 months	Parents of 18 months	Parents of 14 months	Parents of 18 months
Yes	0	0	0	0
No	10	10	100%	100%
No comment	0	0	0	0

According to the parents none of their children produced beat gestures. According to Cassell (2001) children find it difficult to produce. This has been proven by the parents as well. Beat gestures is produced to add emphasize to speech. Children of 14 and 18 months are still not

in the state to produce such kind of gestures. Therefore none of the children produce this type of gestures.

Question 10

Do you and your child share the joint attentional framework?

Table 10

Answer type	No. of parents		Percentages (%)	
	Parents of 14 months	Parents of 18 months	Parents of 14 months	Parents of 18 months
Yes	10	10	100%	100%
No	0	0	0	0
No comment	0	0	0	0

All the parents agreed that their child try to share the joint attentional framework. This proves the idea of Carpendale & Lewis (2004), Trevarthen (1979) that, childrens' joint attentional skill addresses the ability to manage attention with a social partner thus enhancing the communication. Tomasello (1995) stated that through join attention the child and the partner shares a common ground and "collaborative knowledge" takes place. This allows collaborative communication and experience a shared goal

Question 11

Do you think that your child is aware about the gestures that he/she is using?

Table 11

Answer type	No. of parents		Percentages (%)	
	Parents of 14 months	Parents of 18 months	Parents of 14 months	Parents of 18 months

	months	months	months	months
Yes	0	0	0	0
No	10	10	100%	100%
No comment	0	0	0	0

All the parents think that their child is not aware of the gestures that he/she is using. For the children it is just a means of communication. So they do not know what gestures they are using. According to Ekman & Friesen (1969) they are not in the phase through which they can understand the gestures that they are using unlike adults. For children it is not possible for them to be aware of the gestures that they are using because they did not acquire the capability to distinguish between gestures.

Question 12

Do you think that external feedback to your child's gesture facilitates the communicative act?

Table 12

Answer type	No. of parents		Percentages (%)	
	Parents of 14 months	Parents of 18 months	Parents of 14 months	Parents of 18 months
Yes	10	10	100%	100%
No	0	0	0	0
No comment	0	0	0	0

The parents' view about this question is yes. All the parents of both the age group agreed

to it. Ekman & Friesen (1969) said children are facilitated through external feedback and enter the network of communicative acts. According to him when the parents send the feedback to their children's gesture they prove that the gestural act is being received and evaluated. The children get the enthusiasm and try to communicate more.

4.3 Analysis of the observation

4.3.1 Sample and data collection

20 children were observed during their normal play session and while communicating with their peers and caregivers for 60 minutes. There were 10 children with mean age of 14.1, out of which 6 were girls and 4 were boys. The other 10 children had a mean age of 18 months, of which 5 were boys and 5 were girls

4.3.2 Procedure for data analysis

The focus of the observation was to find out the types of gesture-speech combination that children use while communicating. Three types of gesture-speech combinations were taken into account, a. reinforcing relation b. disambiguating relation c. supplementary relation. Each child was observed for 60 minutes. The number of gesture-speech combinations produced by each child during this period was counted. All meaningful utterances that were produced along with gestures were taken into account. After collecting the samples the mean was calculated using the formula, Total numbers of gesture produced by the children / Total number of children. For each combination the same procedure was followed.

a. Reinforcing relation

Total 26 of this combination were produced by the children of 14 months. The mean is calculated as $26/10 = 2.6$. Whereas, the children of 18 months produced total 103 gestures of this type. The mean is $103/8 = 12.875$

b. Disambiguating relation

The children of 14 months produced in total of 8 gestures of this type. The mean of this results, $12/10 = 1.2$. 18 months old produced a total of 19 disambiguating gesture-speech combination. Mean is $19/10 = 2.2$

c. Supplementary relation

Children 14 months produced a total of 5 of this type. Therefore the mean is $5/10 = 0.5$. Whereas, the children of 18 month produced a total of 98 of this combination. Therefore, the mean is $98/10 = 9.8$. Supplementary relation can further be divided into three parts.

- **Argument + argument:** In order to find this only the number of children were counted who produced this type of supplementary combination. It is seen that only 3 children of 14 months produced this gesture. 7 children of 18 months old produced this.
- **Predicate + argument:** The same procedure for this was followed like that of the previous one. 2 children of 14 month old produced this combination. Whereas, 6 children of 18 months produced this combination
- **Predicate + predicate:** None of the children of 14 months produced this combination. 1 of the 18 month old child produced this combination.

4.3.3 Results

Question 1

What combination of gesture-speech is used by the children?

From the data of the observation it is seen that the gesture-speech combination increase as the age proceeds. Almost all the gesture-speech combination is used by both age groups. Only the amount of using the combinations varied. The bar graph shows that for both the age groups

reinforced combination is used the most. Supplementary gesture has been used the least by the children of 14 months. Supplementary gesture adds semantic information to the gesture. At 14 months children have not gained the capability to use this combination. Whereas, children of 18 months used supplementary gestures a lot like that of reinforced gesture. Supplementary relation conveys sentence like meaning. This helps the children to produce sentence like meaning that children cannot produce in speech alone. Reinforced combination of gestures has been used by the children of 18 months. At 14 months, children use less number of gesture-speech combination than that of the 18 months old. This showed that as age proceeds the number of gesture produced by the children increases as they will move to “higher mental functioning” state as told by Les Vygotsky. Also this combination facilitates the communication. All the other combinations do help the child to engage themselves in a social interaction thus facilitating communication.

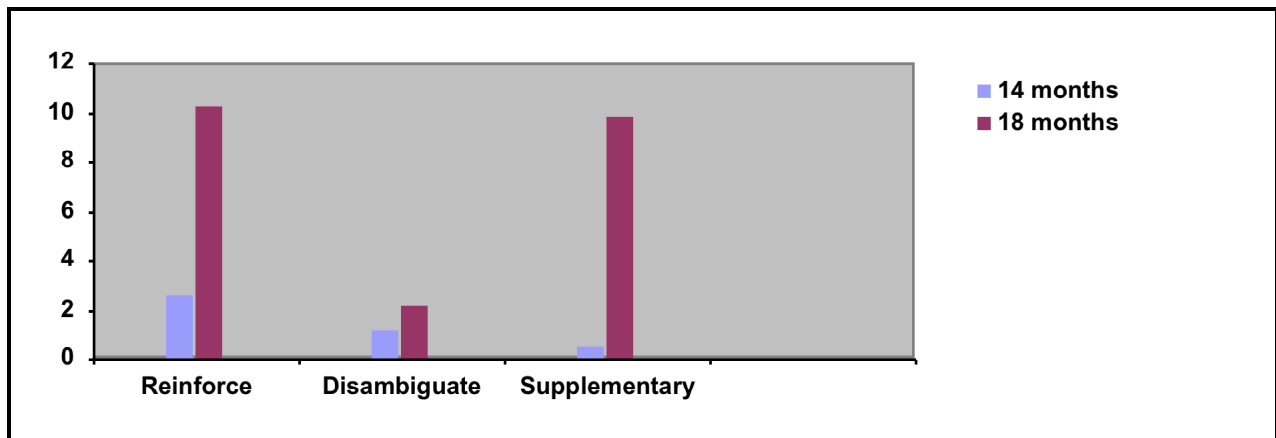


Fig 4: Types of gesture-speech combination produced by 14 and 18 months

Question 2

What type of supplementary gesture-speech combination is used by the children?

As seen that the children of 14 months produce very few of the three combinations. Only 3 children of 14 months produced argument + argument, 2 produced predicate + argument. 7

children of 18 months produced argument + argument, 6 produced predicate + argument. None of the children of 14 months produced predicate + predicate combination. This shows that children of 14 month did not reach the state of using these combinations. Whereas, 1 child of 18 months used this type of combination, this shows that children have started to use these, which portrays that they are at the point of producing sentence like structures.

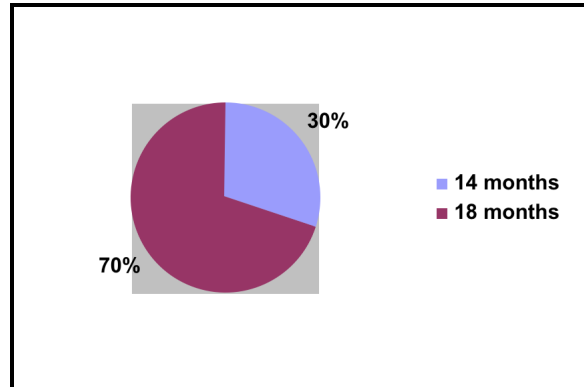


Fig 5: Number of children producing argument + argument combination

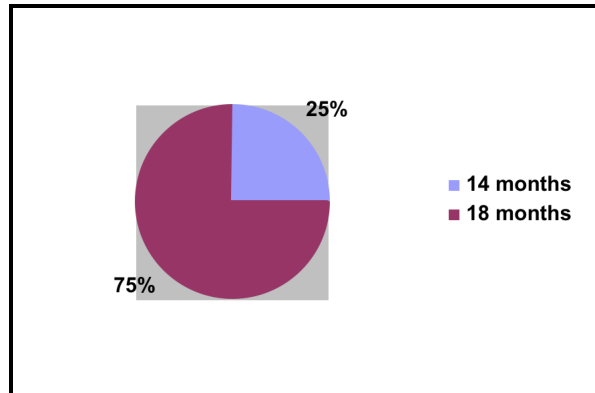


Fig 6: Number of children producing predicate + argument combination

Chapter 5: Conclusion

5.1 Conclusion

There are different kinds of gestures that children use in their everyday life. These gestures vary according to the situation that the children are in. The reason for using these gestures depends on children. Knowingly or unknowingly the children can use these gestures very effectively. It is seen that children of 14 months use different gestures according to their need. Also, the children of 18 months use gestures depending on the situation they are in. It is seen that as age increases the use of different types of gestures also increase. Also, the usage of these gestures increases as well. Not only gestures speech accompanies it for enhancing communication. Children of 14 months use comparatively less number of speech as they have not yet acquired the ability to articulate. Whereas, the children of 18 months can use speech along with gestures as they are on the verge of producing sentence like utterances. It is observed that different types of words are used with different gesture types depending on what the situation depends. Overall, it is seen that children try to communicate at an early age trying to gain attention of the people and the surrounding they are in.

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Appendix

Appendix 1: Interview questions for the parents

Age of child:

Date:

1. What type of communicative method do your children prefer? Only gesture, only speech, combination of gesture and speech or a mixture of all these?
2. How did your child learn the gestures?
3. Why do you think your child use gesture?
4. Why does your child use pointing gestures?
5. If your child does not get the desired result that he/she is expecting after performing a gesture what does he/she do?
6. How do your child responses through their gesture when the external condition changes, (home, outside)?
7. Which joint attentional framework does your child prefer- “responding to joint attention”, “initiating joint attention”?
8. What types of word do your child uses while pointing, (nouns, verbs)?
9. What types of word your child uses along with iconic/representational gestures (nouns, verbs)?

Appendix 2: Questionnaire for parents

Questionnaire for the parents to answer about their child's gestures, its usage and the relation with speech

Age of child:

Date:

1. Do you think that gesture is produced because your child is unable to say a word due to the hindrance like coughing, mouth full of food etc?	Yes	No	No comment
2. Do you think that gesture is produced because your child is unable to retrieve a word from his/her memory?	Yes	No	No comment
3. Do you think that gesture and speech are an integrated system that helps your child to express better?	Yes	No	No comment
4. Does your child produce iconic/representational gestures?	Yes	No	No comment
5. Does your use his/her body parts as an object to create the image of a virtual object?	Yes	No	No comment
6. Do you think that representational/iconic gesture is always directed to you?	Always	Sometimes	No comment
7. Does your child produce metaphorical gestures?	Yes	No	No comment
8. Does your child produce pointing gestures?	Yes	No	No comment
9. Does your child produce beat gestures?	Yes	No	No comment

10. Do you and your child share the joint attentional framework?	Yes	No	No comment
11. Do you think that your child is aware about the gestures that he/she is using?	Yes	No	No comment
12. Do you think that external feedback to your child's gesture facilitates the communicative act?	Yes	No	No comment

Appendix 3: Observational questions

1. What type of supplementary gesture-speech combination is used by the children?
2. What combination of gesture-speech is used by the children?