Gestures of Simultaneous Bilingual Children in Natural Interaction: A Conversation Analytic Perspective

إشارات الأطفال ذوي التزامن اللّغوي الثّنائي خلال التّفاعل الطّبيعي من منظور تحليل المحادثة

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Abstract

Despite the general consensus that speech and gestures are connected, there is much debate on the nature of this relationship. Part of the debate concerns the communicative power of gestures. There are two basic opposing views in this regard: the first position contends that gestures play a vital role in communication. The second opinion assumes that gestures have no communicative value pertaining that they are simple accompaniment of speech. The purpose of the present naturalistic study is then to explore the functions of simultaneous bilingual children's gestures in natural interactions. A qualitative naturalistic method was adopted to gather the necessary data. Six bilingual girls of 6 to 12 years of age were videotaped conversing in English while playing in the house of one of the participants. Nine out of 18 videotaped conversations were transcribed and analysed using the Conversation Analytic method. The participants' gestures were classified in terms of their functions; and the speech exchange in which these gestures occurred was examined. The findings revealed that gestures of simultaneous bilingual children have communicative and interactional functions. They help solve speech problems such as disambiguating speech, adding information, compensating for speech and helping with word search. They also help allocate turns at talk, draw addressees' attention and maintain social relations. The findings also showed that bilingual children's gestures are sequentially aligned with the interactants' responses located in the prior turns; and that these gestures not only help speakers produce comprehensible messages but also help listeners interpret the speakers' speech and react to it gesturally, verbally or bi-modally. Drawing attention to caution regarding generalization of its findings, this study recommends that teachers and learners consider gestures in teaching and learning. Further research opportunities based on these findings are also highlighted.

Keywords: gesture, bilingual interaction, bilingual first (or second) language acquisition, speech-gesture connections.

ملخّص البحث

رغم التوافق العام في الآراء حول العلاقة بين الإشارات والكلام هناك الكثير من الجدل بشأن طبيعة هاته العلاقة. جزء من هذا الجدل يتمحور حول القوّة الاتّصاليّة للإشارات وفي هذا الصّدد هناك رأيان متباينان: الأوّل يقرّ أنّ للإشارات دور مهمّ في الاتّصال والرّأي الثّاني ينفي هاته القيمة التّصاليّة مقرّرا أنّ الإشارات هي مجرّد مرافق للكلام.

يهدف هذا البحث النّوعي الطّبيعي إلى اكتشاف وظائفإشارات الأطفال ذوي التزامن اللّغوي الثّنائي خلال التّفاعل الطّبيعي مستخدما المنهج النّوعي الطّبيعي لجمع المعلومات اللّازمة. وقد تمّ استخدام الفيديو لتصوير ستّة أطفال إناث تتراوح أعمارهم بين 6 و12 سنة وهنّ يتحدّثن باللّغة الانجليزيّة خلال اللّعب في منزل إحدى المشاركات. من ضمن18 محادثة مصوّرة تمّ نسخ وتحليل 9 محادثات باستخدام منهج تحليل المحادثة.ثمّ صنّفت إيماءات المشاركين من حيث وظائفها كما تمّ تحليل تبادل الخطاب الّذي وقعت فيه تلك الإيماءات.

تظهر نتائج البحث أنّ لإشارات الأطفال ذوي التزامن اللّغوي الثّنائي وظائف اتّصاليّة وتفاعليّة. فهي تساعد على حلّ المشكلات الكلاميّة مثل توضيح الكلام، وإضافة المعلومات، وتعويض الكلام والبحث عن المفردات. كما أنّها تساعد على تخصيص الأدوار خلال المحادثات وجلب انتباه المتلقّي والحفاظ على العلاقات الاجتماعية.

وتبيّن النّتائج أيظا أنّ إشارات الأطفال ثنائيّي اللّغة تتّفق تباعا مع ردود المتفاعلين الكامنة في الأدوار السّابقة، وأنّ هاته الإشارات لا تساعد فقط المتكلّمين على انتاج رسائل مفهومة بل تساعد أيظا المستمعين على تفسير كلام المتحدّثين والرّد عليه باستخدام الإيماءات أو الكلام أو الاتنين معا.

مع توخّي الحذر بشأن تعميم نتائجها، توصي هاته الدّراسة معلّمي ومتعلّمي اللّغة الثّانية بأخذ الإشارات بعين الاعتبار خلال التّعليم والتّعلّم، كما تسلّط الضّوء على فرص البحث المكمّلة المبنيّة على نتائج هذه الدّراسة.

Dedication

For the soul of Dr. Clifton Chadwick who will remain forever alive in the hearts and minds of his students.

For my mother, my husband and my daughter.

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Table of Contents

Chapter Four - Research findings

Chapter Five - Discussion

Chapter Six - Implications of the study

Symbols Used in Transcriptions

As suggested by (ed. Richards & Seedhouse 2005)

( )	indicates the point of overlap onset and termination
=	indicates that there is no gap at all between the two turns
(0.2)	indicates an interval between utterances (2 tenths of a second in this case)
(.)	indicates a very short untimed pause
<u>Word</u>	underlining indicates speaker emphasis
u:hh	the colon indicates lengthening of the preceding sound
⟵⟶	indicates the point of gesture onset and termination
A, B etc.	capital letters refer to the pictures on the right side of the page and indicate the point at which gesture and speech synchronise
?	indicates a question
(( ))	indicates editor's comments
!	indicates an emphatic tone
↑	indicates a rising intonation in the utterance preceding the arrow
↓	indicates a falling intonation in the utterance preceding the arrow
,	a comma indicates low-rising intonation, suggesting continuation
.	a full stop (period) indicates falling (final) intonation

Chapter One   Introduction

This in-situ investigation aims to explore how gestures or the movements of hands, arms and fingers are employed by young bilinguals, particularly those who possess good command of two languages. This introductory chapter creates the platform for the whole research by setting the context of the current gesture-language study mainly in relation to bilingual children, establishing the purpose and introducing the questions this study will try to answer. The raison d'être, the significance as well as the limitations of the research are also underscored.

Before proceeding, some terminology and concepts as used in this research need to be explained to avoid ambiguity. First, given that the participants in this study acquired their two languages simultaneously, their languages will be called language A (LA) and language Alpha (LAlpha), two terms adopted from (Wolk 1984, cited in De Houwer 2005). This does not imply that both languages are equal in terms of production and acquisition, but it rather indicates their simultaneous or early acquisition. Second, this study espouses Myers-Scotton's (2006, p. 44) definition of bilingualism as the "ability to use two or more languages sufficiently to carry on a limited casual conversation", although some researchers refer to individuals who speak more than two languages as multi-linguals.

Third, a tentative definition of gestures at this stage in the research is spontaneous hand movements that co-occur with speech and that are part of the speaker's expressions (McNeill 2000; Kendon 2000). Fourth, this research assumes a tight connection between speech and gesture in terms of mental processing and articulation. Finally, the focus will be on the interaction of bilinguals in their everyday talk in natural, bona fide situations using their LAlpha. This interaction involves the dynamic process through which interlocutors are actively engaged in exchanging ideas resulting in a bi-directional impact.

1.1. Background of the study

Language acquisition has long been a matter of debate since the 1950's controversy between Skinner's inductive theory, which contends that individuals need to be taught a language in order

to acquire it, and Chomsky's deductive theory, which pertains that individuals are born with an inner ability to learn language. This nature-nurture controversy culminated in Chomsky's influence on most researchers of that epoch (Kendon 2007). In the 1980s new debates on bilinguals' language acquisition (BLA) cropped up leading to the appearance of different new theories such as Gardner and Wagner's Conversation Theory, new hypotheses such as De Houwer's Single System Hypothesis; and new models for language processing such as Potter et al.'s Competing Models; Bi-Store Model; and Kroll and Stewart's Revised Hierarchical Model. (For further details see ed. Kroll & De Groot 2005)

On similar lines, much research was conducted to answer key issues related to bilingualism, for instance whether the bilingual's brain functions in the same manner as a monolingual's (Galloway & Scarcella 1982), how the mental processing and connection of both languages occur (Heredia & Brown 2004; Kroll & Tokowicz 2005), how lexical items of both languages are retrieved (Pinker 1999) and how bilinguals regulate their use of both languages (Green 1998). Many other studies investigated BLA in terms of the rhythmic differences of the two languages (Byers, Burns & Werker 2010) and their phonetic dissimilarities (Sebastion-Gallés 2006). Another aspect that received much of the researcher's attention is the effect of visual cues on BLA (Weikum et al. 2007).

The prominence of the senses has historically been a controversial issue among scholars and philosophers. The early modern era debates between the Platonic disregard and the Aristotelian mindfulness of the senses (Payne 2013), laid the ground for subsequent arguments on different related issues. At all times, schools of thoughts have either adopted one of those two positions or favoured a midway standpoint that harmonised both extremes. Insofar as gestures in their relationship to speech are concerned they have followed the same thinking trajectories of two contrasting schools, each of which includes various views.

There are two opposing presumptions regarding the speech-gesture relationship. Within this bipartite division there are midway positions within each presumption as will be discussed in chapter two. The first position contends that gesture and speech are two distinct systems of communication, with gesture functioning as a complementary supporter to speech in cases of lexical retrieval difficulty and speech disruption (Hadar et al. 1998; Krauss & Hadar1999;

Levelt, Richardson & LaHeij 1985). The second position assumes so tight a link between gesture and speech that they form an integrated system of communication despite each having a different modality of expression (McNeill 1992, 2005; Kendon 1996, 2011; Goldin-Meadow, Alibali & Church 1993; de Ruiter 2000, 2007; Kita & Ozyurek 2003; Schegloff 1984; Beattie 2003). These differences between the two modalities will be clarified in chapter two.

Notwithstanding the abundant number of investigations into the role of gestures and their implications on the development of an individual's mother tongue, the related literature in terms of bilingualism is sparse (Gullbeg, de Bot &Volterra 2010; Kendon 1996; McCafferty 2008b). Beside their scarcity, most studies on bilinguals have concentrated on cross-linguistic influence, a point raised by Gullberg, de Bot &Volterra (2010) who argue that it is not mandatory for gesture research in bilingualism to be limited to such a phenomenon, pertaining that the learner's language production alone can explain how bilinguals solve lexical, semantic and discursive difficulties. This production is liable to change with the progress of the learner's proficiency which means it is dynamic in nature. The independence of this system from the systems of the first language (L1) and the second language (L2) establishes the possibility of considering it a separate field of study (Gullberg, de Bot &Volterra 2010).

Gesture research in terms of BLA general aspects is next to nothing. However, some research within such a paradigm does exist as many researchers have recently started to delve into such investigations (Gullberg, de Bot &Volterra 2010). In fact, Kita and Ozyurek, (2003), McNeill and Duncan (2000), and Ozyurek et al. (2005) studied whether native speakers of different languages produce the same gestures in their L1 use. Studies in this realm examined co-expressivity of speech and gesture as well as the form of gestures used to express path and manner in motion events in one language, to find that gesturing varies from one culture to another. However, research including 6 to 12 year-old children is scarce. Little is known about the types of gestures they produce and whether their gestures convey meaning. Still less is known about the sequential environments in which these gestures are generated.

Only a relatively small number of studies (e.g. Gullberg 1998; McCafferty 2006; Allen 1995) investigated whether L2 speakers' gestures are communicative, when these speakers tend to gesture, and the context in which these gestures are produced. The rarity of information on

children's gestures and their sequential environments is regrettable for it is a type of information that may be needed by teachers as well as L2 learners to improve teaching and learning, hence L2 acquisition. Gullberg and McCafferty (2008) and McCafferty (2008b) drew researchers' attention to the importance of gesture studies in bilingualism in providing insights into the factors that impact second language development (SLD). If, as this study assumes, speech and gesture are closely knit then the "factors that play a role in SLD in general may also play a role in the development of gesture"(Gullberg, de Bot &Volterra 2010, p. 11).

To the researcher's knowledge, no study on L2 learners' gesture production has been conducted in the UAE or its neighbouring countries. Consequently, this research ventures to work on an issue that has not been explored in the Gulf Cooperation Council Countries. But this is not the only raison d'être of this study. All individuals typically produce gestures when they talk, including children. Yet, some children, including the researcher's daughter, tend to gesture excessively compared to other children, which led to feelings of concern and curiosity. Hence, this study was conducted lest this excess be a sign of hyperactivity. Besides, as the child is bilingual, her gesturing sparked the researcher's interest in bilinguals' gestures.

1.2. Purpose of the study and research questions

This naturalistic study seeks to explore the functions of gestures produced by 6 to 12 year- old children when they communicate in natural situations at home using English as LAlpha. A sine qua non for reaching such an aim is to seek explanation of how and when these speakers produce gestures. At this time, the research draws upon the above-mentioned definition of gestures. The two questions this study will answer relate to the participants' experiences and their context. They can be stated as follows:

1. What are the functions of bilingual children's gestures in natural encounters?
2. What are the characteristics of the sequential environments in which gestures in interaction between bilingual children are deployed?

1.3. Significance of the study

A study of children's gestural expressions in a natural setting may be beneficial for the literature in the field, and for many stakeholders in education such as teachers, students, policy-makers in

the UAE and parents. Curriculum designers, particularly in the UAE, might also include gestures in syllabuses, building on the descriptive analysis of this study. Thus far, neither L1 nor L2 gestures are considered in K12 syllabuses in the UAE despite their crucial role in intercultural communication whose basic aim is to train language users to accept other cultures' ways of communication. Likewise, gestures might considerably help teachers in inclusion schools to successfully communicate with students with particular impairments.

As far as teachers and students are involved, such research might provide them with new insights into possible ways of teaching and learning based on gestures as a means of expression along with speech. It might also explain whether there are shared properties between gestures produced in natural settings and those deployed in L2 classrooms. Teachers might use such information not only to create a classroom setting that is as authentic as possible, but also to design their instructions and activities. Despite this importance, barely are gestures considered in education and "even when gestures are on the classroom agenda, an explicit link is seldom made between language and gesture" (Gullberg, de Bot & Volterra 2010, p. 15). Even at home, parents seldom pay attention to their children's gestures resulting in some miscommunication in certain situations. This study may thus raise their awareness that these gestures might carry meanings and need to be considered in communication.

It is worth mentioning that this research has met many challenges as it relates to a domain in which there is no comprehensive theoretical framework that could account for gesture production in terms of L1 (Bouissac 2006), no similar theoretical framework at all in terms of bilinguals (Gullberg, de Bot & Volterra 2010), no comprehensive processing model or theory related to L1 gestures (McNeill 2005), no processing model, even if incomprehensive, for bilinguals' gesturing, no sufficient research on 3 to 12 year-old children and almost no previous findings to compare or draw upon. Furthermore, it is a type of bipartite study that investigates speech in interaction and gestures that co-occur with it.

From these perspectives, this research will provide further understanding of how 6 to 12 year-old bilinguals use their LAlpha in social interactions within a conversation analytic paradigm. It will also shed light on the way these bilinguals interact using gesture and speech for the organization of turns at talk, appertaining to their communicative competence, language use and intercultural

communication. Furthermore, it will offer deeper insights into the features and functions of their gestures. Therefore, it is hoped that new information this research reveals will fill two gaps, one of which relates to the linguistic production of young bilinguals in natural interaction; and the other relates to their gesture deployment.

In terms of setting, most studies in the existing literature have been conducted in unnatural contexts based on stimuli provided by the researchers whereby the participants are dictated to behave in a particular manner, such as defining words or narrating pictorial questions, resulting in an erroneous transformation (Boiussac 2006). Given that this study is conducted in a natural setting without the researcher's intervention, it might reach different findings from those in the field providing new insights in the role of gestures in L2 acquisition and production. Likewise, graduate students interested in gesture studies might duplicate this research quantitatively to reach more significantly accurate results that might further affect the research field. On similar lines, the study might contribute in the establishment of a more comprehensive theoretical framework that would account for L2 speakers' gesture production, which is missing in the field (Bouissac 2006; Gullberg, de Bot & Volterra 2010; Kendon 1996).

1.4. Scope of the study

The limitation of this research is that it confines itself to a single gender talk due to the cultural norms of the country where the children live. In fact, in the UAE it is not preferable nor allowed for boys above the age of seven or eight to play with girls unless they are siblings. Notwithstanding this limitation the current study might be a contribution to bridge the gap in the literature. This gap is addressed in the succeeding chapter which reviews the literature and the theoretical background providing empirical evidence offered by much observational and experimental research conducted in numerous milieus to investigate various issues related to gesture production in terms of bilingualism.

Chapter Two   Literature Review and Theoretical Framework

2.1. Introduction

The development of different philosophical approaches throughout history has resulted in a sporadic interest in gesture studies. Only around the turn of this century did such studies in relation to language start to take a serious turn with some related theoretical frameworks and processing models that might account for speech-gesture production and interpretation. However, many related issues have not yet been studied, particularly in terms of bilingualism; and the existing theoretical frameworks still have a considerable number of limitations. This chapter discusses all the above-mentioned elements in five sections which provide a historical overview of scholarly interest in gesture studies; explain the adopted theoretical frameworks; discuss some current issues in gesture-speech relationship; and deal with gesture in bilingualism.

2.2. Historical background

Theorists' interest in gesture dates back to c200 BC and emanated from Stoicism, the most predominant philosophy in Greco-Roman times (Stromberg & Howell 1973). Most gesture researchers give credit to Quintilian's *Institutio Oratorio* published around 95CE for establishing the Stoics' beliefs in rhetorical gestures. Quintilian's work influenced many scholars in Europe throughout the fourteenth and fifteenth centuries. Yet, with the rise of Cartesian scepticism in the seventeenth century, the power of the senses was no longer thought to be a form of knowledge acquisition. The Cartesian conviction in the doubtful mind as a source of knowledge led to a rejection of the body from the existing theories (Stromberg & Howell 1973). However, writings on gestures continued to resurface throughout the seventeenth and eighteenth centuries. The emergence of anthropology and the resurgence of the question of language origin led to a belief in the power of gesture to convey meaning (Kendon 2004).

However, the development of technology and the focus on computer simulation which could facilitate translation between languages in the first half of the twentieth century, led to a focus on the hypothesis of language universality (Kendon 2004). Analysis of the components of different languages became a pre-requisite for the study of such speculation. The end result was

generative linguistics with a special emphasis on competence as the major constituent of the human mind to the detriment of performance (Kendon 2004). This was significant for later debate in gesture research as it laid the ground for the idea that gestures could shed light on cognitive processes. Notwithstanding the focus on competence there were attempts to study performance in interactions (Kendon 1996).

The upswing of Chomsky's generative grammar in the 1950s with its emphasis on competence "directed attention to the inner mental apparatus that was proposed as responsible for the existence of any language whatsoever and gesture … was consigned, along with much else, to the waste basket of 'performance' " (Kendon 2004, p. 68). Yet, Chomsky's belief that all children are born with a mental ability to learn grammar led to much research on children's grammatical production in communication; and the issue of whether speech and gesture could develop cognitively started to be studied. Investigations of body movements flowed and gestures became the main object of much research. The development of numerous philosophies such as post positivism and social constructivism led to the progress of empirical studies conducted in natural settings.

The movement towards an interest in natural contexts created fertile ground for the Conversation Analysis (CA) to grow in the late 1960s and early 1970s. At variance with Chomsky's interest in correctness and linguistic rules underpinning his notion of competence, CA proponents argued that rule-based grammar and correctness were not the only prerequisites for communication to be meaningful. They put stress on talk-in-interaction, calling upon verbal and non-verbal behaviour of interlocutors in everyday communication (Heritage 1985). Consequently, the view of gesture, speech and eye gaze as vital elements for talk was enhanced.

2.3. Theoretical frameworks

Notwithstanding the considerable number of investigations on gestures, there are still many questionable theoretical issues (Kendon 1996), one of which is the lack of a thorough theoretical paradigm (Bouissac 2006) with regard to monolinguals, much less in terms of bilingualism. To date, no "exhaustive, consistent and predictive" theory has yet been established and investigators still depend "on dictionary entries and their etymological speculations, or, more commonly, on ad hoc definitions that suit their goals" (Bouissac 2006, p.190). Accordingly, embracing a single

theoretical approach would engender an incomprehensive data analysis. The solution to such a deficiency is to adopt an eclectic theory that congruently selects various elements from different theories.

Within this perspective, two basic traditions in the study of gestures underpin this research: the first approach adopts an inter-psychological paradigm dealing with the functional aspects of gestures as they occur in social interactions; and the second embraces an intra-psychological perspective studying gestures in relation to cognitive psychology. Accordingly, this study adopts two theories suggested by McNeill (2005): the cognitive theory for the study of the speaker's mental processing of both modalities at the moment of speaking; and the communicative theory to comprehend the role gestures play in interaction.

2.3.1. The Cognitive theory

Based on eclecticism, this approach adopts the Growth Point Theory (GPT), the Information Packaging Hypothesis (IPH) and the Thinking for Speaking (TFS) hypothesis to account for the cognitive aspects of speech and gestures. The GPT is the smallest unit of speech-gesture dialectic which marks the beginning of TFS. According to McNeill (1992, 2005), thoughts are expressed multi-modally such that gestures carry the global representation of meaning and speech carries the discrete one, displaying a mutual dependence (McNeill 1985, 1992). In simpler terms, when a speaker has a communicative intention, gestures carry the imagistic conceptual representation of that intention and language carries the linguistic representation. They then both merge to culminate in an overt utterance expressing a single idea in two different forms. The minimal unit in which language and imagery synchronise is the GPT. Thus, the GPT accounts for speech-gesture synchrony and co-expressivity. In fact, the theory assumes gesture and speech to be synchronous in spite of having two different semiotic systems, with gestures being global and synthetic and language being linear and sequential. It is this synchrony that accounts for the close connection between gesture and speech.

One of the limitations of the GPT is that it does not account for asynchrony. To explain such a phenomenon, McNeill (2005) extended his GPT so as to include Kita's (2000) IPH which, in McNeill's (2005, p. 129) words, "…addresses what the GP does not, namely, what occurs when a synchronisation of co-expressive speech and gesture does not occur". The IPH considers the

two systems as independent thinking channels working in parallel and intertwining in time; it is this independence that accounts for asynchrony. According to IPH, when a speaker cannot express their intention in speech, gestures construct a new package of information appropriate for linguistic encoding; which means when speech is obstructed gestures continue. Then speech recommences using this new package of information. When synchrony resumes, another gesture synchronous with the accompanying speech occurs with the renewed speech making up a GP. "The two models, IPH and GP, thus might dovetail in time as well as complement each other in function" (McNeill 2005, p. 129).

The IPH contends that gesture production makes it easy for the speaker to package imagistic information in a way that is compatible with the linear nature of language. According to the IPH, gestural imagistic representations provide means of coordinating information in a way that is different from the analytic representations underpinning language, making it possible for the speaker in speech blockage situations to convey new information adequate for linguistic articulation; for example a speaker describing a house and having difficulty with the word 'opposite' may perform a hand gesture without speech implying that the bedroom and the bathroom are opposite each other (Goldin-Meadow & Alibali 2013), and then may resume the same piece of information in speech and gesture. The synchrony between this new gesture and its co-occurring speech is a possible GP.

In such cases of linguistic blockage many bilinguals have been demonstrated to increase their gesture rate (Gullberg 1998; Krauss &Hadar 1999); to produce many gestures during word search (Gullberg 2011) and to use L1-like gestures with L2 speech, particularly when L1 and L2 are typologically different (Brown & Gullberg 2008). To explain such phenomena, Gullberg, de Bot and Volterra (2010) suggest adopting the TFS hypothesis which, in Slobin's (1987, p. 455) words, "involves picking those characteristics that (a) fit some conceptualisation of the event, and (b) are readily encodable in the language". Put another way, different languages have different semantic elements used to encode linguistic conceptual representations. Using such languages, speakers display distinct TFS patterns such as the case of expressing motion and path in Satellite-framed languages (SFL) and Verb-framed (VFL) ones. Explained from the viewpoint of the GP, TFS is that growth points may vary across language at the moment of speaking (MacNeill 2005).

The basic insight into TFS is generated by the distinction between SFL such as English and VFL such as French. The example below drawn from Hickmann, Hendriks and Gullberg (2011) can explain the difference between SFL and VFL. In "Oscar runs into the kitchen." the manner of motion is expressed in the verb 'runs' whereas the path is expressed in the satellite 'into'. The French translation of the sentence is "Oscar entre dans la cuisine," wherein the path is encoded in the verb 'entre'. As for the manner of motion expressed by 'runs' in English, it is either not mentioned in the French sentence or expressed through an addition such as 'en courant' (while running), so the sentence becomes 'Oscar entre dans la cuisine *en courant'-* the italicized phrase does not exist in the English version. Thus, a French speaker uttering such an expression in English would probably perform a path gesture that synchronises with the verb 'runs'. In such a case, the speaker might be thinking in L1 while speaking in L2.

Much research has undertaken such a theory as a framework in terms of GP. Choi and Lantolf (2008) conducted a study on native Koreans speaking English as L2 and native English participants speaking Korean as L2. Their findings revealed that both types of speakers maintained L1 TFS patterns. However, Brown and Gullberg (2008) found different results. The participants in their study were monolingual native speakers of English, monolingual native speakers of Japanese and bilingual native Japanese speaking English as L2. A comparative data analysis demonstrated transfer of L1 thinking pattern to L2 and vice versa. This bidirectional influence indicates that the baseline TFS pattern might be either L1 or L2.

2.3.2. The communicative approach

McNeill (2005, p. 3) defines gestures as "…everyday occurrences - the spontaneous, unwitting, and regular accompaniments of speech that we see in our moving fingers, hands and arms." The tentative definition of gestures in this research is movements of hands, fingers and arms that either co-occur with speech, or are part of sequential turns in conversations conveying a communicative intention. Typically, all individuals gesture when they talk whether consciously or unconsciously, even blind-born individuals who have never noticed other people's gestures (Goldin-Meadow & Alibali 2013). Besides, ninety per cent of individuals' communication is gestural (McNeill 1992); infants point to objects in the environment to ask for what they need, at all ages individuals gesture to disambiguate speech (Antes 1996, Goldin-Meadow & Alibali

2013), to avoid repetition and to replace speech in case of lexical difficulty (Gullberg & Kita 2009), to regulate turn-taking in conversations and establish relationships (McCafferty 2002).

When people gesture, they generally have a communicative intention and they call for their interlocutor's awareness of the physical environment, the context of the immediate conversation and other cultural and social phenomena so that the message can be interpreted (Kendon 1996). Similarly, people often convey messages without speech by shaking or nodding their heads to indicate disapproval or approval. Gestures can also communicate meaning by alternating with speech, for example when people leave a message incomplete verbally and complete it with gestures (Kendon 1996). A substantial number of studies demonstrated that hand gestures enhance listeners' understanding of the speaker's message (Hornbuckle & Dakon 2002), increase the speaker's accuracy (Krauss 1998) and help listeners interpret indirect requests (Kelly et al. 1999).

If gestures' role were to help speech production with no communicative function, as Krauss, Morrel-Samuels & Colasante (1991) presume, then gesture rate would decrease when the listeners repeat a speech to another listener, which is not compatible with the findings of (Jacobs & Garnham 2007). Besides, in many studies speakers were asked to convey a particular piece of gestural information to a listener without expressing it in the accompanying speech. When listeners were asked to repeat the speakers' talk they expressed both linguistic and gestural information (Melinger & Levelt 2005). These findings strengthen the assumption of the power of gestures to convey information (Graham & Argyle 1975; Kendon 1983).

2.4. Issues in gesture

2.4.1. Speech-gesture relationship

Whether gesture and speech are related depends on whether gestures have their own meaning when performed, which is a controversial issue among researchers. Although there is general agreement that gesture and speech are related there is much debate on the degree and nature of this relationship. More explicitly, the disagreement is about at which point and in which way gestures participate to convey meaning (De Ruiter 2000; Kendon 2004). Researchers have positioned themselves into two different schools of thoughts, each of which is divided into sub-

categories. The first position pertains that speech is fundamental in the construction of meaning while gestures are supplementary. Its proponents argue that both modalities form two independent systems, with the basic assumption that gestures occur at the stage of speech articulation (Hadar et al. 1998; Levelt, Richardson & La Heij 1985; Butterworth & Hadar 1989; Krauss, Chen & Chawla 1996). This set of researchers is further divided between those who contend that gestures help speakers retrieve words from memory, the core concept of the Lexical Retrieval Theory (LRT) (Krauss, Chen & Gottesman 2000); and those who believe gestures to be an instrument that helps package imagistic information into units for verbalization, the constituent idea of the IPH (Alibali, Kita & Young 2000; Freedman 1977).

Contrariwise, the second school believes that gesture and speech form a single system of communication and contends that only in complete absence of speech do gestures play a compensatory role (McNeill 2005). They believe that gestures occur at an earlier stage than speech articulation as they help with the conceptual planning for speaking (Goldin-Meadow, McNeill & Singleton 1996; Kendon 2000). Within this school there are three assumptions depending on different theoretical approaches. The first premise believes gestures to provide a window into the mind in that they disclose some features of the speaker's thoughts, which are not necessarily expressed in speech (Beattie 2003; McNeill 2005; McNeill & Duncan 2000; Goldin-Meadow, Alibali & Church 1993), the essence of McNeill's (2005) GPT. Another assumption within the same school suggests a mutual role of both modalities stressing their reciprocity as two modes of thinking (Kita 2000; Kita & Ozyurek 2003). Proponents of this view contend that gesture and speech are conceptualised in lateral but discrete channels of cognition. The third group put stress on the communicative role of gestures, holding that, along with speech, they convey a coherent idea to provide a multimodal way of expressing meaning (De Ruiter 2000, 2007; Kendon 1994, 2004; Schegloff 1984).

To support their assumption, believers in the separation of the two systems argue that speakers do gesture even when they are not seen by their addressees, such as in telephone conversation, which explains that people gesture out of habit; and that gestures do not have communicative functions (Krauss, Morrel-Samuels & Colasante 1991). The second argument is that lexical gestures (called iconic by the other school) cannot be interpreted in the absence of the co-occurring speech and are thus barely communicative, if they have meaning at all. According to

this view, given that listeners are able to interpret a message even if they do not see the speaker, the plausible conclusion is that gesture-speech meaning is built up by the listener-watcher's comprehension rather than by the systematic integration of both modalities (Krauss, Morrel-Samuels & Colasante 1991).

In response to these claims, believers in the two systems' integration argue that speakers gesture during telephone conversations because gesturing is a spontaneous behaviour that helps them express spatial information verbally to adjust to the non-visibility of the listener (De Ruiter 1995). The other point argued by De Ruiter (1995) is that difficulty in interpreting iconic gestures does not account for their non-communicativity. Contrarily, the fact that they are not interpretable unless they occur with speech indicates they are a non-repetitive source of information.

Both views are backed up by much empirical research. Neurological studies demonstrated that gestures in the aphasias are likely to break down concurrently with speech (Pedelty 1987; McNeill 1992) implying their tight link. From a cognitive perspective, Alibali and Kita (2010) examined whether gestures help conceptual planning and thinking about perceptually present information during explanation of a Piagetian conservation task. The findings confirmed that gestures play a positive role in such a problem explanation as they help children produce more responses. Iverson and Goldin-Meadow (2005) examined if gesture + 1 word combination help develop a combination of gesture + 2 words and found out that gestures facilitate lexical acquisition and development. The implication is that gestures accompany speech at the conceptual level, helping language acquisition.

From a communicative paradigm much research has demonstrated the functional role of gestures in communication (Antes 1996; McNeill 2005; Negueruela et al. 2004) for the benefit of the speaker, the listener and both interlocutors' interaction. In terms of speakers, empirical research demonstrated gestures' communicativity through studies showing that they gesture more when they can see their listeners than when they cannot (Cohen 1977), that gestures accompanying speech convey information (Argyle 1974) and facilitate language production (Rimé & Schiaratura 1991); and that in children's pointing to objects saying 'Give me that' the information is divided between gestural and linguistic expressions (Holler & Beattie 2003;

14

Ozyurek 2002). Even researchers who advocate the separation of gesture and speech showed that gestures help with lexical retrieval (Krauss & Hadar 1999). Another hypothesis in the literature is that gestures help reduce the pressure the speaker feels at the time of speaking (Dittman & Llewelyn 1969), which was denied by Krauss and Hadar (1999) on the basis that this function had never been empirically examined. Some years later this issue was investigated in bilingualism as is shown below.

With regard to listeners, it was demonstrated that the more incomprehensible the speech, the more information the listeners collect from gestures (Gullberg 2011) strengthening the findings that listeners' comprehension is enhanced when they see the speakers' gestures (Rogers 1978; Riseborough 1981; Graham & Argile 1975). For further evidence McNeill, Cassell, and McCullough (1994) studied the effect of gesturing on listeners' recall of information. The speakers were asked to produce mismatches which conveyed non-redundant information in gesture and speech. Retelling the speakers' account, the listeners were then able to recall both types of information. Yet, Krauss and Hadar (1999) argue that these mismatches are rare in natural adult talks, adding that only emblematic and deictic gestures are communicative.

In terms of interlocutors' interaction, Furuyama (2000) investigated whether listeners adjust their gestures so that they are attuned to the speaker's, and the results were positive. The implication is that gestural adjustments indicate that a message is understood by both interlocutors. Beattie and Shovelton (1999a, 1999b) proved that interlocutors are more able to interpret information about size and position when the information is expressed through speech and gesture than through either modality alone. Among the rare points approved by Krauss, Morrel-Samuels & Colasante (1991) on gesture functionality is the role of gestures in maintaining the interlocutors' involvement in communication.

On the opposite side, Krauss, Morrel-Samuels & Colasante (1991) pertain that gestures facilitate speech because they help retrieve words from memory, not because they convey meaning. Rimé's (1982) findings revealing little significant difference in gesture rate in both conditions of visibility and non-visibility of the interlocutor is often used by some researchers to deny the communicative function of gestures (Krauss, Morrel-Samuels & Colasante 1991; Krauss and Hadar 1999), arguing that the difference between the two situations is relatively small and cannot
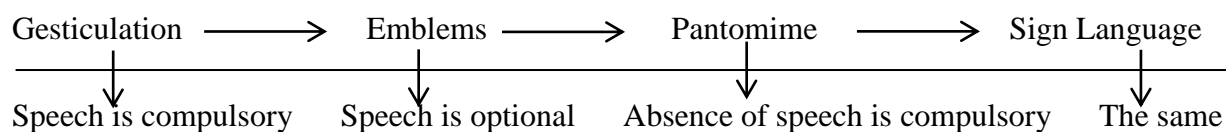
account for the communicativity of gestures, especially that the information conveyed by the gestures is of limited outcome. They also argue that most studies about the effect of gestures on comprehension test the listener's understanding through comparative groups of gesturing and non-gesturing participants, in which case the non-gesturing participants produce more accurate speech; thus they relate comprehension to verbal communication rather than gesturing.

To further strengthen this opinion, in a study conducted by Krauss et al. (1995) in which participants were asked to describe figures referentially, half of the subjects were audiotaped and half videotaped. The results showed that both groups communicated the information equally well regardless of the gestures they produced. The study also demonstrated that gestures do not enhance the accuracy and effectiveness of communicated messages. Another research conducted by Hornbuckle and Dakon (2002) did not find any significant effect of gesturing on comprehension (although Rogers (1978) and Riseborough (1981) did find that gestures enhance understanding). However, Hornbuckle and Dakon conceded the limitations of their study and suggested caution in relation to their findings. They admitted that their experimental group was allowed to gesture while the control group was not, which might have led the latter to attend more to facial expressions and lip movements (Hornbuckle & Dakon 2002).

2.4.2. Features and meanings of gestures

2.4.2.1. Features of gestures

Gestures have been classified from different perspectives. Kendon's (1982) order of classification, which was organized by McNeill (2000) along a continuum, includes gesticulation, pantomime, emblem and sign language. The relationship between gesture and speech along this continuum can be demonstrated in the following diagram adopted from McNeill (2005):

Gesticulation   ⟶   Emblems   ⟶   Pantomime   ⟶   Sign Language

Speech is compulsory   Speech is optional   Absence of speech is compulsory   The same

The idea is that the more one moves from left to right the less natural and less speech-dependent the gestures become, making gesticulation the most speech-linked type. McNeill (2005, p. 5)

focuses mainly on gesticulation because he considers it "the most frequent type of gesture in daily use"; and this study adopts the same focus. Because many types of gestures can be mixed in a single gesture, McNeill (2005) classifies them in terms of four dimensions: iconicity, metaphoricity, deixis and beats. Iconic gestures portray images of concrete objects and are related to the semantic constituent of speech. They may be pictographic, showing the real structure of an object such as shape and size; or kinetographic, showing bodily action such as pushing something (Lazaraton 2004).

Metaphoric gestures, which can be either kinetographic or pictographic, represent abstract objects in that a gesture form represents the meaning of an object/idea that is not present in the actual physical space at the time of speaking, such as shaking hands to represent fear. Deictic gestures index entities that are either visible or metaphoric such as referring to past time by pointing behind (Lazaraton 2004). McNeill (2005, p. 40) expresses it in a more simplified manner, saying that, "abstract deixis creates new references in space; concrete deixis finds references in it", adding that abstract pointing is commonly not performed by children "before the age of 12". Although individuals typically use their index fingers for deixis, they occasionally use other body parts for certain reasons; for example a speaker may use their head to point to an entity when they are holding something with both hands. As for beats, they are flicks of the hands following speech's rhythmical pulse.

2.4.2.2. Meaning of gestures

Many researchers suggest a conceptual link between speech and gesture through which meaning is expressed bi-modally, with each modality expressing different information (McNeill 2005; Church, Ayman-Nolley & Mahootian 2004). Very often the interpretation of the produced gestures depends on the co-occurring speech. Yet, gestures may also communicate meaning when performed without speech, in which case the meaning is interpreted through the sequential context of the talk. For illustration, consider the following example:

Example 1: (Wharton 2009, p. 26)

A: Let's play squash.   (1)

B: [points to a bandaged leg]   (2)

In Example 1, it can be seen that A begins the conversation with a suggestion (line 1) that requires B's reply. B's reply can either be verbal or gestural; however, it is completed gesturally (line 2). A linguistic alternative to this gesture might be 'I can't play squash because my leg is injured, or 'my leg is injured'. B's pointing has meaning insofar as A's previous turn is considered as it provides a hint for the interpretation of B's turn. Thus, gestures need to be interpreted in terms of the co-occurring speech as well as the sequential context of the moment-to-moment interaction. Another factor impacting gesture interpretation relates to gestures that accompany speech. When both forms are produced concomitantly a speaker performs successive and quick gestures, in which case it becomes difficult to distinguish between the termination of one gesture and the beginning of the successive one, especially that researchers demonstrated that most times there is no retraction (hands returning to rest after one gesture) between successive gestures (McNeill 2005).

2.5. Gestures and second language research

2.5.1. Functions of bilinguals' gestures

Much research has been conducted on bilinguals in terms of speech, with a plethora of journals and publications. However, studies of bilinguals' gesturing are still nebulous in spite of the importance of gestures as a communicative strategy which is crucial to language acquisition. According to Canale and Swain (1980) language speakers' communicative competence is determined by three types of competence: grammatical, socio-linguistic and strategic. Grammatical competence refers to the speaker's knowledge of lexis and rules governing language. Yet this knowledge is not sufficient for effective communication, which requires socio-linguistic competence in order for the content to be coherent and cohesive. If the speaker has a lack of grammatical and socio-cultural rules of a language they need to use their strategic competence, which refers to the use of verbal and non-verbal practices for effective communication (Canale & Swain 1980).

A handful of studies have investigated bilinguals' gestures in terms of their communicative competence. Gullberg (1998) investigated the strategic use of gestures by Swedish and French learners of English as L2. Her findings revealed they used gestures to ask their listeners for help

with word search. Similar results were found by McCafferty (2002) wherein an L2 learner of English produced a gesture for the word 'splash' as he did not know the linguistic representation of the term. The listener, being a native speaker, uttered the word for him, which he annexed to his speech solving his linguistic problem. Further evidence was provided by McCafferty (2002) but within the paradigm of the Zone of Proximal Development (ZPD).

2.5.2. Gestures and second language acquisition

In terms of bilinguals' acquisition, McCafferty (2008a) studied L2 metaphoric gestures produced by a Japanese adult speaker of English as L2 speaking about perfect marriage. The participant was able to gesture and internalize L2 gestures and speech related to the ideal marriage in North America. On similar lines, in a longitudinal study, McCafferty (1998) investigated whether speakers' gestures of the abstract when speaking English as L2 change over time, more specifically if gestures develop along with speech in L2 usage. He found that the use of gestures develops significantly with the use of L2. Similar results were found by McCafferty and Ahmad (2000) highlighting the role of gestures in L2 development. Furthermore, investigations of teachers' gestures and their influence on students' comprehension (Lazaraton 2004) revealed that gestures play a crucial role in students' comprehension.

Although research on gestures in relation to bilingualism is generally scarce, many studies investigated cross-linguistic influence in expressions of path and motion, adopting Talmy's (see McNeill 2005) languages typological differences (Stam, 2006; McNeill & Duncan 2000; Brown & Gullberg 2008; Choi & Lantolf 2008). Research conducted in terms of these differences demonstrated that when speakers use their L2 they produce gestures related to their L1 with regard to form (Brown & Gullberg 2008; Negueruela et al. 2004) and synchrony (Stam 2006; Kellerman & Van Hoof 2003). In relation to grammar and fluency, Stam (2006) examined Spanish L2 speakers of English describing motion in narratives, to demonstrate that their gestures revealed L1 patterns of TFS but with accurate grammar and L2 fluency. The implication is that L2 learners acquire language before acquiring L2 thinking patterns. Other features that have barely been investigated include the way bilinguals maintain discourse when they use L1 and L2, and the mismatch in L2 speakers' gesture speech production (Gullberg, de Bot & Volterra 2010).

All the above-mentioned studies include many contradictory findings in relation to bilinguals'
gestures. This research might shed light on the communicative role of bilingual children's
gestures through the use of the conversation analytic method which will be fully described in the
following chapter.

Chapter Three   Methodology

3.1. Introduction

This chapter provides detailed information on the methodology and the implementation process of the study drawing upon the criteria of naturalistic studies. As mentioned in chapter one, the objective of this study is to explore the function of gestures as performed by 6 to 12-year-old bilingual children in natural interactions; and the characteristics of the sequential environments in which these gestures are deployed. Answers to such questions are best explored through a naturalistic design particularly since gestures are liable to change if the participants feel disturbed by the researcher's presence.

3.2. Research paradigm, design and analysis frameworks

3.2.1 The qualitative research paradigm

Grounded in anthropology and sociology, the qualitative approach derives from social constructivism which contends that knowledge is constructed during interactions in the real world (Creswell 2013). Interest in this epistemological perspective led researchers to found the principles of qualitative methods compatible with research adopting the social constructivist philosophy. The goal of qualitative research is to explore certain human interactions in particular social settings. Marshall and Rossman (2011) recommend investigators access the real world of the participants, wherein they understand the meanings introduced by the participants to the settings during their interactions.

3.2.2. Research design

This study adopts the natural, observational design which is defined by Creswell (2013, p. 14) as "...a design of inquiry coming from anthropology and sociology in which the researcher studies the shared patterns of behaviours, language, and actions of an intact cultural group in a natural setting over a prolonged period of time". Thus, the purpose of the design which is in complete alignment with the objective of this study is to explore naturally occurring behaviours in

particular settings through deep and recurrent observations in order to obtain a comprehensive account of the way the participants offer up their experiences.

3.2.3. Conversation analytic framework

The Conversation Analytic (CA) method deals with interactions in natural social settings. It assumes the structural organization of conversations wherein participation is context-shaped in a sense that a current action is shaped by a prior action that speakers need to consider in order to make meaning as well as to produce that current action. The current action is also context-renewing as it sequentially forms the context for a subsequent action. Thus, there is always a newly created action during every turn, making up a knit architecture that keeps inter-subjective comprehension in each talk (Seedhouse 2005). Actions are also context-free as they may be produced in a single turn involving a variety of situations in which speakers of multiple identities interact. At the same time they are context-sensitive in that they are employed in a social interaction between the speaker at that turn and the following speaker in the subsequent turn; and here lies the emic perspective.

According to Hutchby and Wooffitt (1998, p. 36) 'The aim of conversation analysis ... is to explicate the structural organization of talk-in-interaction at this interface between context-free resources and their context-sensitive applications". A distinction between emic and etic is provided by Richards (2005) who relates the emic to social actions from the participants' perspective and the sequential context of the interaction. The etic relates to language conventions which are not decided by the speakers' interaction. Therefore, the etic standpoint examines behaviour outside a specific system whereas the emic view investigates behaviour inside the system as created by the speakers (Richards 2005).

These behaviours are arranged in a chain of turns that are organized by the participants according to the turn constructional and turn allocational constituents. Indeed, turns are constructed of units of talk and turn transfer occurs at the completion of such units. This is why this point of completion is called transition relevance place (TRP). Turn transfer occurs when a speaker selects the next speaker; and in case of no selection any non-speaker may self-select.

Furthermore, the content of a turn is constrained by a prior turn, particularly in what Schegloff and Sacks (1973) call adjacency pair parts (APP). This is a pair of actions that tend to occur responsively such as questions-answers. Other rules set by CA relate to repair and topic arrangement. Repair is a mechanism whereby speakers resolve problems related to speaking, hearing, understanding or organization and transfer of turns (Richards 2005). Repair can be self-initiated or other-initiated with a difference in the point at which the repair occurs.

CA also accounts for the sequential analysis of non-verbal actions that fill a turn such as vocal markers ('mm', 'hm') used to start a turn (Schegloff 1982), eye gaze which can indicate a request for the addressee to talk or to pay attention, and gestures as used in coordinated actions between participants to decide who is to speak next, what to speak about and many other pragmatic aspects (Goodwin 1981).

3.3. Data

3.3.1. What is data?

In order to explore the gestures of bilingual children in natural interaction and their sequential environments, both gestures and speech need to be considered, particularly as this study assumes a tight link between both modalities of expression. Gullberg, de Bot and Volterra (2010) suggest three paradigms for the study of bilinguals' gestures: the structural perspective dealing with the spatial configuration of gestures; the semiotic dimension bearing upon the meanings that gestures convey; and the functional aspect which accounts for the role gestures play in communication in terms of addressee and speaker. A comprehensive analysis that can encompass these three dimensions requires the examination of stand-alone gestures, gestures that co-occur with speech, and gestures as performed in natural talk. An example of data type is demonstrated below:

Example 1: (Thursday, February 4, 2016; Living room).

Tina: Pa:nipuri (0.4) ((silence))   (1)

    It's like u:hh you know small puri?   (2)
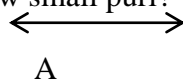
                A   A

In Example 1 while the speaker produces her speech she performs a gesture; and because the gesture co-occurs with speech this is considered one turn. Because the turn is long it includes

more than one line as numbered on the right. The horizontal arrow represents the gesture performed and the letter A under the arrow shows the speech element that co-occurs with the gesture. It also refers to the picture on the far right side of the page. In this example both gesture and speech are considered data. The analysis of stand-alone gestures involves a sequence of turns that create the setting for the occurrence of the gesture. Moreover, since pictures are larger in size than the transcribed speech, data are presented in a table format for clarity reasons particularly as one extract may include two or more pictures. The transcription of some extracts (i.e. Extract 1) is inserted on a separate page because if it is spread across two pages the speakers' overlapping becomes indistinguishable.

3.3.2. Setting and event

This study was conducted in the house of one of the participants, being the researcher's. To ascertain as much objectivity as possible, the selection of the site was left to the participants and their parents. The researcher did not exert any influence on the participants so as to obtain ethically sound findings. The investigator endeavoured to establish a comfortable and clean atmosphere where the participants would feel cheery, secure and free to play the way they wanted.

Based on the natural method of investigation, this study focuses on the natural talk and everyday experiences of the participants while playing or conversing. Topics and games were selected by them. The major goal is to explore the types of gestures produced and the way these body movements are deployed naturally. During the events the participants took up many activities, providing this study with rich data. They communicated in English as it was the only language everybody understood. Many events took place over many successive weekends which provided the participants with many opportunities to play and talk. The fact that most participants are neighbours living in the same building facilitated their regular contact.

3.3.3 Apparatus and data collection

Audio-visual up-close data were collected on a weekly basis from the 14th January through February, 2016. During this period, every week the six participants gathered in the house to play, though some participants joined the group only four times. Two digital cameras were placed so

as to capture the participants from various angles, a Canon and a Samsung, two brands known for their accuracy and clarity. One was placed on a shelf opposite the participants' location and the other camera was placed in a location where the whole room could be captured. The videotaping lasted for sixty to ninety minutes per event. Although the participants were not told about the recording nor were they aware of the cameras before data collection, their parents were. Before data analysis everything was revealed to them.

Given the nature of the study and because gestures accompanying speech are very quickly produced, the only data form able to collect appropriate information was the audio-visual means. In fact, digital cameras can easily capture audio-visual instances as well as gestural sequences, which are necessary for the analysis of speech-gesture synchrony. Similarly, they can be used without being noticed by the participants, establishing the observer's paradox and keeping data as natural as possible; they can record all the details of the events including setting, activities, time, date and place; and they provide the opportunity to replay the events in slow motion obtaining all necessary details without pressure. However, if the recording was not clear data transcription would be difficult and their interpretation would be misleading resulting in unsound findings. For these reasons the researcher tried the cameras some days before the events started to ascertain their clarity.

Concerning ethical considerations, it is legitimate for the participants' rights, wishes and moralities to be respected and considered. The qualitative approach is by nature intrusive (Creswell 2013), so researchers need to be cautious about participants' personal information. This study is sensitive in the sense that it was conducted on children who might behave in a manner that would reveal personal information their parents would prefer to conceal. They might also unconsciously produce gestures that are indecent in certain cultures. Therefore many ethical measures were taken to protect the participants:

1. Before conducting the study the code of ethics of BUiD was carefully read and the permission of the participants' parents was obtained through a written letter (Appendix). Before signing parents were briefed about the purpose of the study and the way data would be used; and they were informed they could withdraw their approval at any stage of the study.

2. During the research the participants were informed about the general purpose of the study. They were also told that their participation would be voluntary. Similarly, for cultural ethics no males were included, no pictures were inserted without the consent of the parents and culturally harmful gestures were not selected. The participants were given fictitious names, were treated well and equally, particularly because the researcher's daughter was among them. Concerning data analysis all the findings were disclosed, even the ones that were incompatible with the other studies in the literature.

3. After the study raw data were kept in a safe place and the participants were offered gifts. The data and the findings are intended to be shared via the publication of the research.

3.4. Participants

The participants in this research are six girls whose age range is between 6 and 12 years. Five have acquired English as L2 since birth and they use it at home equally with their mother tongues. The sixth started to acquire English as a baby in nursery but mostly uses Arabic at home. Many researchers consider such children who are exposed to two languages since birth as native-like speakers; and different labels are used in the research field to refer to them such as 'compound bilinguals', 'simultaneous bilinguals' , 'early bilinguals' and 'bilingual first language acquirers' (Myers-Scotton 2006).

Considering five of the participants of this study as simultaneous bilinguals is supported by the literature of studies on L2 speakers. Similar types of participants were studied by De Houwer (2005). They were under six years old and had acquired two languages from birth until the time of the investigation. De Houwer (2005) refrained from labelling any of their two languages as L1 because both languages were considered their L1. Yet, for the purpose and nature of this study LA is used to refer to the mother tongue and LAlpha to English.

All the participants were born in the UAE and were sent to nurseries where English was the only medium of communication when they were 45 days old. They all study in the same K12 school where English is the medium of instruction in all disciplines. Students in this school use English as a lingua franca outside the classrooms because they have different mother tongues. A description of the profile of each participant is provided below. For ethical reasons composite profiles and aliases instead of real names are used.

Tina: She is a 12-year-old seventh grader. She was exposed to English as LAlpha since birth. English is the official language in her country of origin and is more used than her mother tongue in her family environment. She produces a lot of gestures along with LAlpha speech.

Rita: She is six years old, in grade one, and is Tina's sister. She was also exposed to English as LAlpha since birth. She gestures a lot when she speaks English.

Darin: She is a nine-year-old fourth grader. She was exposed to English as LAlpha and French as L2 since birth. English, French and Arabic are used within her family with English being dominant, though Arabic is her LA. She also produces a lot of gestures while speaking in English.

Helen: She is a nine-year-old fourth grader. She is a classmate to Darin and Zoe. Her LA is Arabic, which is used along with English at home, with Arabic holding a dominant position. She was also exposed to English as LAlpha since birth. She gestures a fair amount when communicating in English.

Zoe: She is a grade four student of nine years of age. She was exposed to English as LAlpha from birth. Both English and her mother tongue are used to communicate within her family. She also tends to gesture a lot when she speaks English.

Nancy: She is ten years old and in grade four. She was exposed to English as LAlpha when she was 45 days old, but does not have much contact with English outside school as her family tends to speak Arabic at home. She barely produces gestures when she speaks English.

3.5. Researcher's role

One of the basic characteristics of natural research is to observe participants while they are constructing their meanings of the world through interaction (Creswell 2013). CA supporters assume that "it is the job of the social scientist to gain access to people's 'common-sense thinking' and hence to interpret their actions and their social world from their point of view" (Bryman 2001, p. 14). To ensure compatibility between the type of observation and the nature of this study, the researcher's position, as with the apparatus used to collect data, were concealed. The participants were informed about the study but did not know what behaviour would be

observed, or when the observation would start. The observer was not present when the participants were being videotaped by two hidden cameras, in order to avoid the Hawthorne Effect (participants' change of their behaviour because the observer was paying attention to them).

Notwithstanding the unobtrusive observation and the naturalness of the scenarios the researcher's bias is likely to interfere in data interpretation especially as there is no convention underpinning the observed behaviour (gesturing). A corollary consequence of this lack of convention is that personal experience and intuition play their role. Insofar as this researcher is concerned, she acquired experience of using and interpreting different types of gestures when she was a teacher in K12 schools. She also trained teachers on gestures as a teaching tool when she was a supervisor of English language at the Ministry of Education in the UAE. Additionally, as mentioned in chapter one, the researcher's daughter gestures excessively, which led the researcher to read a considerable number of resources on gesturing. This background not only helps her understand the gestures and the context in which they are produced, but also enhances the researcher's consciousness of the challenges that could be met during data analysis and interpretation.

3.6 Data Analysis procedures

This step consists of a bottom-up analysis starting from the gestures produced by the participants culminating in a set of generated themes. Creswell (2013) recommends that data analysis start conjointly with data collection in qualitative studies. This was carried out in this study by watching the videotaping after each event so as to jot down the gestures and insert them in different columns to start organizing them according to their meanings. After the last event, all the events were watched again with careful attention to speech. They were replayed and paused when gestures were produced. These pauses were turned into still pictures to be used as illustrations for the findings. Speech was transcribed in a sketchbook with marginal remarks on specific gestures, and then all the gestures were catalogued along with the speech that accompanied them. Then the transcripts were read again while each participant's production was watched.

Then data were 'whittled down' (focusing on the most important and related data).Thus nine extracts were selected based on their functions and their relation to the problem the study tries to understand; and the questions it tries to answer. These extracts were then reassembled in three separate themes. The three themes were then classified into three categories according to the types of gestures produced by the participants: gestures and problematic talk; gestures and discourse; and gestures and space. Arrows were used to mark convergence of some gestures and intertwinement of the themes. After that, a hand coding of the extracts was applied using the transcription conventions available in (ed. Richards & Seedhouse 2005). These codes were written under the transcribed speech segments and pictures were inserted next to their co-occurring speech. A descriptive analysis including linguistic quotations from the participants' speech was developed. The findings were interpreted in terms of the participants' understanding.

3.7. Reliability and validity

3.7.1. Reliability

Seedhouse (2005) distinguishes the factors behind strong reliability of CA research. They include good recording qualities, accurate selection of the data to be analysed, and transcript adequacy. Other factors involve the way data are presented and whether the findings can be replicated. In this study detailed transcripts are included in chapter 4 and the analysis procedure is described in detail, which makes it possible for readers to evaluate the analysis and replicate the data on other types of participants. Similarly, the apparatus was technically well-applied as mentioned above and even the information that may seem trivial in the selected extracts is considered.

3.7.2. Validity

Bryman (2001) identifies four types of validity:

a. *Internal validity* refers to whether the data prove what the research asserts. A reader of any CA study may wonder about how a researcher can know what the participants' interpretations are. Plausibly, although CA studies individual interactional practices as interpreted by the participants, these actions are analysed in terms of a systematic organization which renders the

emic dimension normatively accessible. Benson and Hughes (1991, pp. 130–131) emphasize this point by stating that: "The point of working with actual occurrences, single instances, single events, is to see them as the products of a 'machinery' ... The ethno-methodological objective is to generate formal descriptions of social actions which preserve and display the features of the machinery which produced them". Likewise, the claims made by the researcher do not go beyond what is demonstrated within the range of this rule-based system. Furthermore, in this study, no prescribed theoretical framework, linguistic conventions or prior suppositions from outside the participants' interaction is included in the analysis, nor is the speakers' production judged on the bases of correctness or incorrectness.

b. *External validity*: Individual actions in communication are produced according to a machinery that allows their generalizability. Individual speech and gestures (micro aspect) are described as they occur in a specific social authentic setting of the immediate interaction with reference to CA norms that lead to such behaviours (macro aspect). Some aspects of these descriptions are generalizable by principle as interactions are rationally structured in terms of social goals.

c. *Ecological validity*: This requires the possibility of applying the findings of the study in the daily life of individuals. One of the features of CA method is its strong ecological validity since it deals with naturally occurring talk as it happens in everyday life. These actions are not specific to the participants at talk, for example gestures accompanying speech are found in all people's talk though they differ in terms of the context in which they are deployed.

d. *Construct validity*: The constituents of the interactions that CA accounts for are those oriented by the speakers. During interactions, the speakers sequentially create their own reality and CA creates knowledge out of that reality as understood from the participants' viewpoint. Thus knowledge is obtained from what actually takes place rather than from what is supposed to happen.

The objective of this chapter has been to pave a way for the description of the methodological procedures of this study. Going beyond theory toward practice, the next chapter provides data description and findings that show not only bilingual children's gestures but also the sequential environments of this practice.

Chapter Four   Research Findings

The aim of this chapter is to display the findings collected through videotaping in light of the research questions which try to explore the functions of bilingual children's gestures using English as LAlpha in natural interactions, as well as the characteristics of the sequential environments in which gestures in interaction between bilingual children are deployed. The findings of nine separately described extracts are presented in terms of three major themes: gestures and problematic talk; gestures and discourse; and gestures and space.

4.1 Gestures and problematic talk

All individuals including children gesture when they talk regardless of their language. Whether intentionally or not, gestures help bilingual speakers not only explain problematic points initiated by their recipients, but also add meaning to their communication. Gestures assist the speaker in encoding meaning and help the listener decode it. The following extract demonstrates how a bilingual speaker uses hand gestures to provide a deeper semantic meaning to her speech.

Extract 1 (Friday, January 22, 2016; Living room)

Darin: Then you put caper on the top before serving=	(1)	
Helen: =What's that?	(2)	
Darin: The caper is something green like olives, <u>so</u> salty (0.2) we use it on the top (0.3) It's like (0.1) pretty small (0.3) as much as this A[1]	(3) (4) (5)	 A
Helen: ((Looks at the speaker's gesture)) B Ah! like chickpeas	(6) (7)	 B
Nancy: ((nodding))	(8)	
Tina:= Ah yes (.) I ate that in a restaurant in Dubai.	(9)	
Darin: OK, also you chop some parsley for topping (0.3) C	(10)	 C
Helen: Let's continue cooking.	(11)	

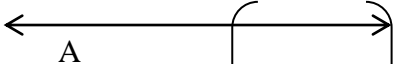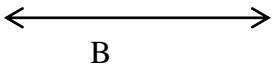[1] A refers to picture A on the right side of the page.

Speaking about the ingredients used for topping a particular type of food, Darin (on the left) describes capers, unripe rounded green flower buds grown in the Mediterranean. Helen initiates a repair (line 2) showing she does not know what capers are. Darin provides three consecutive helps. On line 3, she describes capers in terms of colour and taste. During Darin's 0.2 sec.-pause, Helen could have indicated that she understood what capers are, but she didn't take any turn. Darin concludes that the problem is not fixed, so she provides a second help (line 4). She gives another locational description of capers. This is still followed by a long pause (0.3 sec.) reasonably assuming that Helen still does not understand. Then the last help is provided in turn 5 wherein she gestures to explain the size of capers.

Turns 4-5 show pauses indicating constructional unit completions where Helen could have shown to Darin a sign of understanding. For Darin, Helen's non-response means lack of understanding. As a repair of the failure of turn-taking, she increments her turn size by resuming talking. She also seeks help in a pictographic iconic gesture to represent the size and shape of capers (picture A), articulated by the tip of her right-hand index touching the tip of the thumb to make a small circle (keeping the remaining fingers more or less extended). Line 5 is the turn in which gesture and speech co-occur. While her speech provides information about the colour, taste and size of the described object, being green, salty and small (lines 3, and 5); her gesture offers information about its shape, being circular. Helen understands the meaning of capers after she has seen Darin's gesture (line 6). Her understanding is evident in her utterance 'Ah' in turn 7.

In terms of APPs turns 7 and 8 take place at the same time, each may be a second pair part to the first pair part composed of Darin's turn (line 5). Another explanation is that turn 8 may be a second pair part to Helen's turn line 7. Helen produces an interjectional utterance in a rising tone 'Ah' and compares capers to chickpeas (line 7), which are also small and circular. Nancy (line 8) nods her head either in response to Darin's gesture or to Helen's turn line 7 as it sequentially occurs right after it. Tina's turn (line 9) responds to Helen's turn line 7 which triggers her memory about a past experience of eating capers. These three responses might indicate that the recipients have understood the meaning of the described object.

The two turn entry devices ('Ah', 'Ah yes') and Helen's nodding indicate that the problem is successfully resolved by Darin, so Darin changes the sub-topic from describing capers to adding another topping. The word 'OK' (line 10) might be a second pair part making up a reply to the three prior turns (lines 7, 8 and 9) meaning 'now that you have understood what capers are'. Darin then produces another iconic gesture through which an actional verb is kinegraphically presented (picture C). Opening her left hand palm up to represent a cutting board and using her right hand to represent the action of chopping through repeated forward movements, she shows the children how to chop parsley. This gesture contains new information that is not conveyed in speech, the use of the cutting board. Then the long pause made by Darin line (10), hands the floor to Helen who considers it as an indication of utterance completion, takes the turn (line 11) and closes the conversation by changing the topic in a downward intonation. Aside from adding information to the produced speech, gestures are also a helpful tool for speakers to search for lexical items, as the extract below shows.

Extract 2 (Friday, January 29, 2016; Living room)

Tina: =What do you put in it?	(1)	
Darin: Potato, tomato, pumpkin and chili (.)	(2)	 A
No green u:hh (0.2) green u:hh (0.2) A	(3)	
Tina: Pepper=	(4)	
Darin: Pepper (0.1) and…yeah, and you cut the:m and	(5)	 B
you put eggs on the:m u:hh then (0.1) you fry	(6)	
them and the:n (0.1) you smash them all. B	(7)	
Nancy: I like mixed veggies, and spicy.	(8)	

34

In this extract Darin explains how to make a type of food the children have eaten for dinner. When Darin pauses (line 2) in speech she holds her gesture which resumes along with speech. This gesture hold might be a mechanism through which Darin maintains her turn. Eliciting the ingredients, she identifies that she has a linguistic difficulty as indicated by her repetition of 'u:hh…u:hh' (line 3). The indication that she identifies the problem is that soon after mentioning the word 'chili' (line 2) she says 'No' to self-correct (line 3). Considering the location of the word 'chili' right before 'No', the negation (line 3) might be a repair to the repairable lexical item 'chili', probably meaning 'this is not the word I am looking for'. Through her two pauses (line 3) she may either try to recall the searched-for word or wait for another repair. She then asks for help through a gesture that locates the next speaker who will complete the word search, indexing Tina (picture A), being the interlocutor whose question makes up the first pair part to her turn.

Tina, being the indexed addressee, is able to figure out that she can be the next speaker whose help is sought by Darin. Tina may have guessed the word 'pepper' by considering Darin's words 'chili' and 'green' (lines 3 and 4). Darin acknowledges Tina's suggestion by repeating the word 'pepper' (line 5) and by saying 'and…yeah' (line 5). The use of the continuer 'yeah' along with the various short pauses (lines 5, 6 and 7) indicates that Darin becomes confident that no-one would compete for the turn. Moreover, the sound stretches in the words 'the:m', 'u:hh' and 'the:n' may indicate that Darin is in a state of thinking about what to say next. To help herself produce speech she performs a kinegraphic gesture (picture B) showing how to cut and mix the ingredients. Though Darin does not mention the action of mixing in speech, Nancy obtains that information through the interpretation of Darin's gesture (line 8).

Thus, extract two illustrates that bilingual children use deictic gestures to seek another's help with word search; and produce kinegraphic gestures to compensate for speech when explaining an action. The following extract shows that bilingual children use a gesture other than deictic for word search, and provides further evidence that gestures are multifunctional in terms of communicativity. It includes three hand gestures used to elaborate meaning, to add information and to look for lexical items.

Extract 3 (Thursday, February 4, 2016; Living room)

Tina: In India the food is very delicious and [very tasty	1	
Darin: [But it is spicy!	2	
Zoe: I like spicy food	3	
Tina: I <u>like</u> panipuri	4	
Nancy: Padipuri?	5	
Tina: <u>Pa:ni</u>puri (0.4) ((silence)) it's like uhh you know small puri? <----------> A	6 7	![A] A
Nancy: Small what?	8	
Darin: Small meat↑ balls	9	
Tina: No, it's a round dough, fried , fried yes (0.2) You dip it in a sour <u>soup</u>, or chutney (0.3) You <u>dip</u> it and you eat it (.) it's very tasty <----------> B	10 11 12	![B] B
Darin: Soup or sauce? Like ketchup, mustard (0.2)	13	

Tina: <u>Soup</u> with u:hh what do we call that? Chickpeas,
<------------------>
           C
  it's actually called chutney paste we put a green sour
 	
  paste and a red sweet paste in the soup
	14
	
	15
	
	16
		![C]
		C

Zoe: <u>Sour</u> (0.1) <u>very</u> sour.	17	

In this extract Tina initiates the talk about panipuri, round fried bread dipped in flavoured soup. She is overlapped by Darin who tries to compete for the turn (line 2) by disagreeing with the prior turn through the conjunction 'But', as well as supplying information about the food being spicy (line 2). Tina directs her eye gaze towards Nancy first, being the one who initiates the problem through her confirmation check in a rising tone (line 5). Line 4 is the turn that includes the source of the problem, being 'pani'. Nancy's repetition of part of the prior turn (line 5) introduces a turn order bias which selects the prior speaker (Tina) for a second pair part. Other correction is carried out by Tina who pronounces the word again, putting stress on it and lengthening the sound 'a:'(line 6).

Tina then produces a long pause (line 6) in an attempt to pass the turn to any of her recipients whose response might show they have made meaning of her speech. Yet, nobody takes the turn as indicated by the silence (line 6) which Tina interprets as a clue that her recipients might not envision the meaning. After Tina corrects Nancy, the pronunciation problem is solved. Then she self-selects to complete her turn (line 7) and describe the word performing two gestures (picture A) to help her recipients make meaning and to repair the turn-taking failure. The first gesture which co-occurs with the word 'small' (line 7) is articulated by the right-hand thumb tip touching the tip of the index expressing size; the second is performed through the use of the left-hand index and thumb to make a circle representing shape. Nancy's question (line 8) initiates another problem related to the word 'puri' indicated by 'what' in an interrogative form. Line 7 is the turn that encompasses the trouble source.

Similarly, Darin's turn (line 9) shows that the feature-problem has moved from pronunciation to size (small) and shape (round). As her turn comes between two adjacent pairs (lines 8 and 10), it interrupts the activity but in a topically relevant manner. Line 10 comes as a disagreement to the previous turn expressed through 'No' providing new information in lines 10, 11 and 12. However, this repair involves additional trouble sources apparent in the expressions 'sour soup' (line 11) and 'dip' (line 12). Through her pause (line 11) Tina tries to give the turn to any of her recipients, but as no-one speaks she identifies that her addressees still have a problem understanding. Thus, she produces a new gestural repair that includes a metaphoric use of form (picture B), by putting her right hand palm-up in a bowl shape. Although the gesture is synchronous with the word 'dip' it does not iconize a dipping action, it rather represents how

chutney is served in a small bowl. Thus, the gesture and its co-occurring speech convey two different versions of the same communicative intention. This mismatch leads to Darin's initiation of the trouble about whether the object described is dipped in a sauce that is served with it, or in soup (line 13).

In a second pair part, Tina emphasizes the word 'Soup' providing more evidence by the fact that chickpeas are added to it (line 14), which is not normally added to the types of sauce mentioned by Darin (line 13). If turned into a verbal expression compatible with the previous turn (line 13), this emphatic tone would probably be 'soup, not sauce'. Tina self-initiates her problem with the retrieval of the word 'chickpeas' from her memory as indicated by her use of the language filler 'u:hh' and her self-questioning 'what do we call that?' (line 14). Through this questioning she tries to invite her addressees to repair, but she soon performs two simultaneous iconic gestures (picture C): one with the index and thumb of the right hand representing smallness, and the other with the index and thumb of the left hand representing a circular shape. Looking at her gesture, she promptly self-repairs by remembering the word (line 14) and continues her talk. Zoe's response, along with her emphatic tone indicates that she is familiar with panipuri, a fact that Tina probably knows as both of them come from two neighbouring countries. This might be the reason why Tina looks at all her addressees except Zoe and her sister Rita.

It is demonstrated that gestures are used by bilingual children to avoid ambiguity, convey additional information and help self-repair such as retrieving words from memory. Although Darin and Tina use iconic gestures for word search their gestures differ in terms of type and strategy. In extract 2 Darin uses a deictic gesture to ask for repair from her interactant whereas in extract 3 a pictographic gesture is performed by Tina to self-repair. It is essential to note that gestures are not only produced to help speakers, but they also help listeners detect the speakers' errors as displayed in the below-described event.

Extract 4 (Thursday, February 11, 2016; Living room)

Zoe: My aunt has a big house,
 	
    it has two storeys with four bedrooms
      ←——————→
         A
	(1)
	
	(2)
		
		A

Darin: <u>Three</u> storeys or two?	(3)	

Zoe: Yes three one two three.
    ←——————→
       B
	(4)	
		B

This extract shows how the addressee figures out an error in the speaker's speech through the accompanying gesture. Zoe initiates the talk by describing her aunt's house (line 1). In line 2 she mentions the number of storeys in the house. When she utters the word 'two' (line 2), she deploys an iconic gesture with three extended fingers representing the number three (picture A). The mismatch between the two modalities of expression is detected by Darin who does not know the aunt's house. Yet, her belief in gesture more than speech leads her to initiate the trouble by drawing the speaker's attention, asking her indirectly to self-repair, putting emphasis on the word 'three' (line 3). If expressed verbally, Darin's emphatic tone could probably be 'three storeys as you have shown or two as you have said?' Zoe's gesture helps her addressee enter into her (speaker's) mind and figure out the produced error. After being scaffolded, Zoe acknowledges the trouble by saying 'Yes', corrects and reformulates her prior turn in speech (line 4) and in gesture (picture B) using her palm-down open hand, moving it upward three sequential times while saying 'one two three' (line 4). The counting (line 4) and the gesture (picture B) represent two different things: the number and the floors.

This excerpt shows that sometimes gesture and its co-occurring speech cause problems when they convey conflicting versions of the same event. Another finding is that turn allocation is obvious as the conversation is dyadic. Furthermore, there is no overlap or gap, no pause and no restart because Darin is busy looking at the gesture and Zoe knows that, which is socially acceptable. Darin's question (line 3), making a first pair part to the following turn, is produced at a relevant transition point (after Zoe completes her turn), and Zoe's last turn (line 4) is an obvious second pair part, bearing an answer to the previous turn. Contrary to this extract the following conversation is triadic including iconic and deictic gestures to determine subsequent speakers and regulate discourse structure.

4.2 Gestures and discourse

The data provided by the videotaping also reveal that gestures are used to progressively participate in the discourse by helping speakers create shared thematic elements and select their next speaker.

Extract 5 (Thursday, February 11, 2016; Living room)

Darin: Did you enjoy the party?	(1)	
Tina: Yes, we enjoyed it, my aunt enjoyed herself too.	(2)	

Rita: She weared something to cover her face
  ← ————————————— →
    A
 	
    and the top of her dress was glittering=
	(3)
	
	(4)
		
		A

Nancy: = All the brides wear like that?	(5)	

Rita: Yes she knows that=
   ← ———— →
    B
	(6)	
		B

40

Zoe: =Oh yes my aunt also <u>wore</u> that.	(7)	
Darin: In my country the bride wears	(8)	
gold on top of her head and a veil, like a triangle. ⟵————————⟶ C	(9)	C
Zoe: My aunt's veil was like a triangle too it was so big, it covered her face and her head. ⟵————————⟶ D	(10) (11)	 D
Tina: Yes, it's almost the same in many countries.	(12)	

This storytelling is initiated by Darin asking if Tina enjoyed her aunt's wedding party (line 1). Because Darin looks at Tina and Rita when she asks the question (line 1) Tina understands that 'you' (Line 1) refers to her and her sister. That is why she uses 'we' (line 2) in her answer, involving Rita in the conversation, the reason why she takes the turn (line 3). Yet, she soon changes the topic from describing feelings to describing the bride's clothes. The iconic kinegraphic gesture (picture A) she performs marks the end of the previous topic and the initiation of a new one particularly that it starts before the production of its synchronous expression 'to cover' (line 3). Through this gesture she also secures the interlocutors' attention at the start of the new topic. She puts her palms on her front and performs an up-down movement to show how her aunt, a prototype of an Indian bride, covered her face in her wedding.

Nancy quickly self-selects (line 5) for a turn leaving no room for any pause after the previous turn (line 4). This is marked by the equal signs at the end of line 4 and the beginning of line 5. After answering Nancy's question positively, Rita bi-modally allocates the turn to Zoe (line 6): she deictically points at Zoe (picture B) and affiliates an address term saying 'she knows that' leading to Zoe producing a formal affiliator to the prior turn ('Oh' line 7) to speak about the same theme.

Competing for a turn, Darin (line 8) overlaps and performs an iconic gesture (picture C) to secure the audience's attention towards her rather than Zoe, knowing that the turn is not hers. She raises both hands with the two palms open touching her front and forming a triangular shape of a veil (picture C). In lines 10 and 11 Zoe also performs an iconic kinegraphic gesture (picture D) that is similar to the ones produced by Rita (picture A) and Darin (picture C) in type and configuration. This gestural alignment in the ongoing discourse creates a well-knit topic related to veils and weddings in a systematically organized context wherein the knitting of the storyline is conducted through the use of the same gesture to start the topic and to end it. Thus, all gestures are similar because they accompany talk on the same topic. This gestural match is identified by Tina who concludes that the cultural issue spoken about is 'almost similar' in many countries (Line 12). Her deduction closes the conversation leaving no room for further turns.

While the three iconic gestures produced in this extract (pictures A, C and D) are used to express different cultural aspects, they all have the same form features in terms of handedness and space. This phenomenon, called catchment, provides a gesture-based discourse cohesion that parallels the thematic maintenance of the sequential context. Hence, gestures not only help speakers to provide information but also to specify a subsequent speaker in natural interaction, to generate a topic that may be shared by the participants and to maintain the structure of the discourse. Hand gestures can also be used to enact an event, adding clarity to the intended meaning and substantiating the discourse structure.

Three other points are worth mentioning here. The first is that Rita's specification of her subsequent speaker is socio-cultural in nature as it is based on her knowledge that in Zoe's country the bride also covers her face and wears the same type of dress. The second is that Zoe takes the turn to confirm Rita's turn (line 5), to initiate a grammatical problem ('weared' line 3) and repair it through the emphatic form of the word 'wore' (line 7). The third is that gestures move in parallel with the storytelling, helping the discourse to progress smoothly. Alternatively to the view of gestures playing a crucial role in discourse structure, they are also used to keep spatial relations between speakers in interaction, as the next section reveals.

4.3 Gestures and space

Gestures are also used with regard to social and mental relations, as experienced by the interlocutors in natural conversations. This section illustrates how referential gestures are deployed by bilingual children in a specific social space as defined by the interlocutors' bodies; and how this shared space determines the orientation of the gestures produced depending on the location of the participants.

Extract 6 (Thursday, January 14, 2016; Living room)

Helen: Let's play hopscotch.	(1)	
Nancy: I don't know hopscotch.	(2)	

Darin: You make squares
    ←——————→
       A
 	
You write numbers in each box and you jump on them
             ←————→
              B
 	
If you make a mistake   you get out.
        ←——→
           C
	(3)
	
	(4)
	
	(5)
		
		A
		
		B
		
		C

Tina: Look (0.1) I have another idea (0.1) let's sing
       ←————→
          D
	(6)	
		D

Rita: Who is going to sing first?=	(7)	

Darin: =Me and <u>Zoe</u>.
  ⟵⟶
    E
	(9)	
		E

This excerpt is initiated by Helen who suggests playing hopscotch (Line 1). Turn 2 responds to this suggestion and provides the context for turn 3 for which Darin self-selects to explain how to play the game. She then adjusts her seating orientation by turning to Nancy making this a dyadic interaction. Then she uses the shared space to provide Nancy with directions. She performs an abstract deictic gesture using her palm-down open hand on the floor within that space (picture A) while saying "you make squares" (line 3). In a subsequent gesture, Darin indexes an imaginary box in the same shared space (picture B) to show where to write numbers (line 4). According to the rule which Darin explains (line 5), if a player makes a mistake she is out of the game. When she says 'you get out', she laterally moves her hand on the right side out of the shared space (picture C) performing a spatial gesture to synchronise with the word 'out'.

 At the completion of Darin's turn, Tina takes the turn marking a generic sequence as her gesture (line 6) begins a new topic, which is about singing. The pre-expansion of her turn via the word 'Look' (line 6) is a preliminary for an announcement which is used as a device to prepare her interlocutors for a subsequent talk. She also produces a metaphoric gesture (picture D) to represent an abstract concept (an idea) by using her index finger pointing to the conceptual idea in the space in front of her. Answering Rita's question (line 7) about who will sing first, Darin regains her initial position in the circle (picture E), pointing to Zoe within the space shared by all the participants. This deictic gesture is used to engage a non-speaker in the discourse.

This section demonstrates the use of gestures (pictures A, B and C) by bilingual children to elaborate on talk about abstract content and objects non-visible at the time of speaking (hopscotch, table, square); and to mark boundaries between topics as exemplified in the gesture produced by Tina (picture D). This exophoric reference supports visualization as the participants assume that the abstract concepts are in front of them. It thus helps the speaker to manually

visualize abstract objects and helps the listener to see that content in the physical space. Through gesturing, Darin metaphorically uses the shared space to represent elements that are not in visible range. In addition, by adapting her gesture orientation to the spatial environment of the immediate event, Darin leads her gestures to display spatial relations as experienced by the two interactants, which shows that gestures are moulded by the way space is socio-culturally organized. Accordingly, when she moves her hand out of the shared space Darin might mean 'out of the space we are sharing', keeping ties with her addressee. Although four of the produced gestures (pictures A, B, C and D) are metaphoric in nature they include a deictic constituent because they allow the placement of these abstract elements in the physical space.

Contrary to the metaphoric gesture used to represent abstracts, the referent of the indexical gesture (picture E) is present in the immediate space at the moment of the speech event. So gestures are also used to refer to entities that exist in the real space of the conversation. This type of gesturing can alternatively be used metaphorically to refer to entities that are not present in the immediate space at the time of interaction, a practice described in the succeeding extract.

Extract 7 (Thursday, February 11, 2016; Living room)

Helen:= I like Mum Jiji.	(1)	

Zoe: Yeah↑ She is g:ood, I <u>love</u> Mum Praba ↓,
   the way she comes,
 	
   she stands at the door waiting   for us to enter.
   ←————————→
         A
	(2)
	(3)
	
	(4)
		
		A

Darin: Y:es, I like her too, but I like Mum Shazia most
   she inspired me too much
 	
   she used to let me help her in the TV room
   ←————→
     B
	(5)
	(6)
	
	(7)
		
		B

45

Tina: You know when I was in grade four, the first day
 	
    of school I saw her name on the door of the
    $\longleftrightarrow$
              C
 	
    classroom I was so happy
	(8)
	
	(9)
	
	(10)
	
	C

Here, deictic gestures are used as spatial references to represent non-present entities. The participants use metaphorical deixis, either spatial or temporal, to refer to their teachers. Helen initiates the talk (line 1) and Zoe, in an unmarked turn shape, quickly produces a straightforward responsive action ('Yeah' line 2). Darin does the same thing in her turn (line 5), which means that both instances mark a relation to the prior turn. Zoe refers to the action of waiting as performed by her preferred teacher who would stand at the classroom door waiting for the students to come (picture A). She expresses the information in speech (line 3) and points to the door (ground) of the room where the immediate interaction takes place to refer to the classroom door (that is not visually close) where the teacher (referent) used to wait for her students (picture A). She thus creates a relation between the conceptual space in which the referent exists and the actual physical space by referring to the door of the room where the immediate interaction takes place to represent a non-present entity performing an action.

On similar lines, Tina, using 'you know' (line 8) as a pre-expansion for her turn to prepare her addressees for the new information, refers to the same door (picture C) as a proximal distal in the actual geographic location to refer to the conceptual referent which is the door of her classroom (lines 9 and 10). Thus, both Zoe and Tina use spatial deixis to refer to entities that are conceptually present but non-existent in the immediate event. The third gesture produced by Darin is a temporal deixis (picture B) performed by raising the arm, opening the hand and pointing behind with the full hand. It is used to refer to the teacher ('she', line 7), which synchronises with the produced gesture; as well as to the (imagined) school TV room. Two factors might lead Darin to refer to the space behind her: the fact that the event took place in the past; and the space shared with her addressees. When she gestures, one of the addressees is at her left and four facing her, which shows her gesture to be outside the shared space.

Other data related to space reveal that one of the purposes of gesturing is to refer to geographical locations, in which case gestures display the speaker's mental map of the space she lives in. In the following extract one of the participants spatially describes Telengana, her city of origin, in relation to New Delhi.

Extract 8 (Friday, February 26, 2016; Living room)

Tina: Madhya Pradesh is v:ery nice, 　　　you can see many touristic sites and greenery	(1) (2)	
Helen: Is it far from New Delhi?	(3)	
Tina: If you go by train it will take one day, 　　　　　←——————→ 　　　　　　　A 　　but if you go by plane it will take one hour. 　　　　　　←———→ 　　　　　　　B	(4) (5)	 　　A　　　　　B
Darin: Is it big?	(6)	
Tina: Yes, Madhya Pradesh is a big town and Bhopal is 　　　its capital, but we are basically from Telengana 　　　in Bhopal	(7) (8) (9)	
Nancy: You have family there?	(10)	
Tina: I have one aunt in Delhi umm her husband is from 　　　　　　←——→ 　　　　　　　C 　　there, but all my family, my grandparents, my other 　　aunts and my uncles live in Telengana. 　　　　　←———→ 　　　　　　　D	(11) (12) (13)	 　　C　　　　　D
Darin: Do you go there often?	(14)	
Tina: No, because of my father's job (.) 　　　　　←—————→ 　　　　　　E 　　He doesn't have many vocations.	(15) (16)	 　　　　E

47

A close analysis of this extract reveals that Tina gestures to represent distance, movements and directions in the actual physical space of the speech event. All turns except the first are adjacency pairs constituted of questions and answers. As suggested by Helen's question (line 3), Tina takes up New Delhi as a location against which she measures the distance to Madhya Pradesh in terms of time depending on two different means of transport, the train (line 4) and the plane (line 5). Through the gestures she performs, she moves from one spot to another to draw her recipients' attention to the two possible ways of measuring the distance. When she mentions each means of transport in speech, she performs two separate iconic kinegraphic gestures that exhibit a combination of movement and direction (pictures A and B). In the first gesture (picture A) she opens her hand laterally making a forward movement that divides the actual geographical space into two parts imitating a train crossing a path. In her second gesture (picture B) she raises her arm with the palm down open-handed, moving it downward to represent the motion of a landing plane.

Through her gestures Tina creates a mental map that probably includes New Delhi, Telengana and the UAE. To refer to New Delhi she uses her right hand with the fingers extended to refer to her right side (picture C). This gesture represents the distance between New Delhi and Telengana. Locating herself discursively at an intersecting position between the two towns, she raises her hand open to refer to her left pointing to a location assumed to be Telengana (picture D). Having one hand to represent Delhi and the other Telengana she constructs a narrated space. As her turn is long (lines 11, 12 and 13) she uses a temporal regulator ('umm' line 11) probably to help organize her ideas. It is noticeable that Tina does not use directional expressions in speech such as 'to the north, or to the east'. Yet, considering the narrated space, New Delhi is to the right, Telengana to the left and the speaker is in between. This in-between location might be the UAE, the location where she now resides, represented by the shared space between the interlocutors. This is apparent in her last gesture (picture E) which indexes a central space between left and right when she says 'my father's job', pointing to her father who is not present during the conversation but is in the house opposite from where the event takes place.

In terms of the sequential environment of the interaction, the interlocutors' interpretation of each other's speech is based on previous turns. Furthermore, Tina uses sentential constructions which allow turn length. Helen (line 3) and Darin (line 6) use the pronoun 'it' as an anaphora to refer to

Madhya Pradesh, which is mentioned by Tina in a previous turn (line 1). Tina is able to interpret the meaning of this anaphoric use, as by relating the two uses of 'it' (lines 3 and 6) to the town she mentions (in line 1) the meaning becomes obvious; and the same case applies to the word 'there' (line 10). However, Nancy's use of 'there' (line 10) is ambiguous as it may refer to New Delhi, Madhya Pradesh or Bhopal. The only place that may be excluded from this ambiguity is Telengana because if Tina is 'basically from Telengana' as she says (line 8) she obviously has at least some relatives there. To solve this ambiguity Tina mentions the two places where all her relatives live (lines 11, 12 and 13), indirectly meaning 'all my relatives live in two places, New Delhi and Telengana', whatever 'there' means. Thus, the constructional units of her turn are constrained by Nancy's question in the prior turn.

Moreover, the use of anaphoric expressions helps to maintain thematic and sequential coherence that is also spatially established through catchments (gesture features that reappear over many gestures) in Tina's gestures. These catchments are common in children's use of spatial gestures especially when describing a living space. Similar to this extract, the following conversation shows how bilingual children use the space of the actual speech event to create a narrated space shared by the interactants; and how space is restructured by social organization such as the way the interlocutors are seated.

Extract 9 (Thursday, February 11, 2016; Living room)

Rita: When you go into my house (0.1)
 	
←————————→
        E
 	
you find the kitchen on the left and the washroom
          ←————→
              B
on the right, we also have three rooms and a balcony.
←————→
        C
	(1)
	
	(2)
	
	(3)
		
		A
		
		B C

Darin: Tina said you also have a garden	(4)	
Rita: Yes, we have a small garden at the back	(5)	

49

Zoe: What do you keep in your room?	(6)	
Rita: Here there is a table to study (0.2) in the future, next,	(7)	
here there is one big cupboard and one small cupboard, ← —————————————————→ D	(8)	
the big cupboard has one two three four, four doors.	(9)	D
Darin: Do you have a balcony in your room?	(10)	
Rita: No, when you go like this, after the kitchen you find a ← ————→ E	(11)	
hall, in the hall there is a balcony.	(12)	E

This interaction, like the previous one, is also mostly composed of adjacency pairs with no overlaps. Rita initiates the talk with a description of her house. Apparently, for Rita the shared space means her house, as she raises her two hands symmetrically holding them in the space identified as her house as well as the distance between the entrance and the kitchen (picture A). This gesture co-occurs with the expression 'you go into my house' (line 1) with the gesture stroke synchronising with 'go'. Although the gesture represents the entrance of the house, it synchronises with the motion embedded in the verb 'go' rather than with 'into', being the path. Thus by performing a gesture with path only Rita seems to decompose the motion event. Besides, with this metaphorical deictic gesture performed at the debut Rita establishes a locus to which she returns when she describes the location of the hall, (line 12) which is to the left of the kitchen that is located at the entrance of the house, as mentioned in line 2. The two spatial deictic gestures (Pictures B and C) are used to point to two non-visible referents (kitchen and washroom) in the immediate space and are performed after the speaker adjusts her seating.

Considering the gestures performed all through this extract, one catchment can be detected consisting of using palm-open hand pointing to the right (picture C) or left (pictures B and E). This catchment which is driven by visuo-spatial imagery is associated with the entrance of the

house. Besides, Rita points only to the shared space which, in her mind, represents the house. That is why when she describes her room (lines7 and 8) she uses the word 'here' meaning 'in the space where we are now sitting'. The short pause (0.2) she produces (line 7) may imply that an important piece of information is upcoming. The pause occurs right after 'Here there is a table to study' (line 7). Rita actually lives and studies in the UAE, which means that the desk she describes will be used when she goes back to study in India: right after the pause she adds 'in the future' (line 7).

It is noticeable that the metaphoric deictic gesture she deploys (picture D) using her two hands to display the placement of the two cupboards in the shared space that represents her room reveals morphokinetic and topokinetic accuracy. The shape of her hands in space (morphokinesis) as well as their position in relation to each other (topokinesis) implies that she has control over her actions, hence over space. Therefore, by creating a narrated space shared by all interlocutors Rita restructures the physical space of the immediate conversation to maintain social relations with her interactants.

5. Conclusion

In this chapter, it has been demonstrated that hand gestures are an additional source of information that can be used along with speech by bilingual children to express their communicative intention more comprehensively. Their multifunctional nature allows speakers and listeners to use them in various contexts to transmit a variety of messages. Speakers use gestures to add information, disambiguate speech, search for lexical items, ask for help with lexical difficulties, describe non-visible objects, represent abstract events, regulate turns at talk, and hold and regain recipients' attention. Recipients' gestures result in addressees' eye gaze, helping them to make meanings of the received message, detect the speaker's errors, detect if the speaker is seeking help and express lack of understanding. Socially, the findings show that gestures help interlocutors to keep and organize their social relations.

The following chapter pushes toward a discussion of the findings in an attempt to answer the research questions posed in chapter one. Re-examining some of the details provided by the described data, it will discuss bilingual children's gestures under different types of organization,

linking the current findings to some of the studies mentioned in the literature review in chapter two.

Chapter Five   Discussion

This chapter discusses the findings of the present study, aiming to discover the functions of bilingual children's gestures and the characteristics of the sequential environments in which gestures are deployed in interaction between these children. It also recalls the findings of other studies mentioned in the literature review. However this link is established to strengthen the outcomes of the current research rather than to compare both types of results.

5.1. Sequential Relationship between Gestures and Trouble Talk

In this section gestures are discussed in terms of talk sequences in order to better understand how they relate to prior and subsequent turns at talk. There are two types of talk sequences in which bilingual children's gestures are identified. The first type involves intra-turn gestures used to initiate a problem. These gestures start when a speaker tries to produce and understand her own speech. The gesture is then deployed in a trial to fix a speech-related problem. An example can be found in extract 3 line 14 where a gesture occurs in a single-turn sequence, as shown in the following diagram

Speaker: trouble source

[gesture as problem initiator]

Diagram 1: Gesture as a problem initiator at a single-turn level.

This diagram demonstrates that gestures are not social or interactive because they do not involve other participants' interaction as Tina performs the gesture for self-problem initiation and self-repair. The trouble is indicated before the repair is gesturally initiated through hitches in the talk exemplified in the prolongation of sounds in the previous expression (Schegloff, Jefferson & Sacks 1977). Consider the following example of extract 3 line 14:

Example 1:

Tina: <u>Soup</u> with u:hh what do we call that? Chickpeas

⟵——————————————⟶

Tina's gesture starts with the onset of the self-questioning (what do we call that? Chickpeas). The sound stretch in 'u:hh' represented by the colon is a pre-indication that a repair initiation is coming up. In extract 2 line 7 Darin produces the same prolonged sound, but this time the sound itself is a problem initiator after which repair is cancelled, especially as the gesture that follows the sound is not a repair, but a continuation of the turn at talk as projected before the occurrence of the repair initiator.

The second type of gesture occurs within a sequence of turns between the participants. These gestures are performed before trouble talk; that is to say before a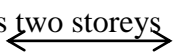 listener has a problem in understanding. Here gesture makes up part of the source of the trouble - the other part being speech. It can be shown in the following diagram:

A: Utterance [with an accompanying gesture]   (1)
B: trouble initiation   (2)

Diagram 2: Gesture as a source of trouble talk relationship in two turns at talk.

As shown below, extract 4 line 2 is a clear example of such an instance.

Example 2:

Zoe: My aunt has a big house   (1)
    it has two storeys   with four bedrooms   (2)
Darin: Three storeys or two?   (3)
Zoe: Yes three one two three.   (4)

According to diagram 2, the turn in which the gesture occurs provides the context for the subsequent one as the problem occurs when B does not understand A's gesture/talk. Zoe gestures by extending three fingers when she says 'two storeys'. Her gesture-speech mismatch leads to Darin's lack of understanding whether the house has two storeys (indicated in speech) or three (represented in gesture). In such examples where gestures and speech mismatch, either of the two modalities of expressions is the source of the trouble. Yet, the IPH contends that "when there is a mismatch, the gesture is likely to embody the correct strategy" (McNeill 2005, p. 137) because

individuals believe in the power of gesture more than words, which means that the source of the trouble is the mismatch rather than the gesture.

Other types of gestures used in a sequence of turns are performed either to ask for other repair as shown in extract 2 line 3 or to self-repair a trouble as demonstrated in extract 1 line 5, extract 3 lines 7, 12; extract 4 line 4. The following diagram may add clarity to these occurrences:

> A: utterance (trouble source)
> B: trouble initiator
> A: utterance with gesture (trouble repair)

Diagram 3: Gesture as a repair strategy in a sequence of turns at talk

These gestures sequentially derive from prior turns and are conditionally performed as a response to them. They mostly occur in what Schegloff and Sacks (1973) call adjacency pair parts with the first part representing the trouble initiator and the second representing the trouble repair. Gestures then become part of the main talk as the trouble initiation and gestural repair become the focal talk until the problem is fixed. Examples of gestures as second pair part are in extract 1 line 5, extract 3 line 7 and extract 4 line 4. Similarly, in alignment with the contention of Schegloff, Jefferson & Sacks (1977), speakers prefer self to other repair as it is apparent in many extracts (extract 1 line 5, extract 3 line 14, extract 4 line 4). Yet, this is not always true as in extract 2 line 3 Darin favours other repair by gesturally inviting Tina to provide her with an outcome to her word search.

5.2. Gestures and Comprehension: Effects on Learning

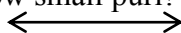The findings reveal that speakers gesture to disambiguate speech making it more comprehensible for their addressees (extract 1 line 5, extract 3 line 7). The example below from extract 3 illustrates gesture use for speech disambiguation:

Example 3

Nancy: Padipuri?   (5)

Tina: <u>Pa:ni</u>puri (0.4) ((silence))   (6)

    it's like uhh you know <u>small puri?</u>   (7)

Gestures are also revealed to add information that is not expressed in speech (extract 1 line 10; extract 2 line 7; extract 3 line 12; extract 4 line 4) as illustrated by the following example from extract 2:

Example 3:

Darin: Pepper (0.1) and…yeah, and you cut the:m and

you put eggs on the:m u:hh then (0.1) you fry

them and the:n (0.1) you smash them all.

In this example, the kinegraphic gesture produced by Darin to represent the action of chopping the ingredients (picture B) provides information about mixing the constituents, which is explicitly expressed in speech. The fact of cutting, frying and smashing the components does not necessarily mean mixing them. The other possible meaning of Darin's speech is to follow the mentioned steps with each ingredient apart. Had Darin added the word 'together' after 'smash them all' then the fact of mixing would have become obvious. Yet, the gesture produced shows cutting many ingredients in the same container which gives the meaning of mixing. This is how the gesture is interpreted by Zoe who says 'I like *mixed* veggies' (line 8). Although this gesture and the gesture in extract 1 (Picture C) are both kinegraphic representing the action of cutting, they provide different types of information about the way of cutting each type of food. The second gesture shows how to cut the ingredients into small pieces, but the first displays how to cut the components till they are crushed and mixed. Other uses of gestures include emphasis of speech conveying information (extract 5 Lines 3, 9, 11) and speech compensation (extract 9 line 11).

The above-mentioned functions of gestures have crucial effects on language learning. Garber, Alibali and Goldin-Meadow (1998) showed that a learner's knowledge changes along with their development and this change includes ways of expressing that knowledge. At a certain stage, learners are unable to express particular concepts in speech so they call on gestures to accomplish such a practice. Since this knowledge is implicitly expressed in gestures rather than explicitly in speech, Garber, Alibali and Goldin-Meadow (1998) call it implicit knowledge, which, as they demonstrated, sets the ground for future learning. This knowledge displays the capacities existing in the child's ZPD, reflecting what the child has started to learn and what she is liable to learn. In terms of recipients, speakers' gestural output is for listeners a source of

information that helps them interpret the speaker's intentions. If gestures add information, clarify speech and compensate for it, they then provide listeners with a more accurate comprehensible input. They also offer a wider range of vocabulary enriching the listeners' gestural and speech repertoires.

The findings also reveal that gestures are used by bilingual children as a scaffolding mechanism which is a key factor for language learning. In extract 4 line 4 Zoe's second gesture occurs after Darin's support through a question that helps her recognize the mismatch. In terms of IPH, this gesture shows a new package of information compatible with the produced speech creating a new GP. Hence, both gestures in this extract create intersubjectivity in the ZPD. Similarly, the gesture produced in extract 3 line 14 helps Tina scaffold herself leading to her remembrance of the word chickpeas. Likewise, in extract 5 lines 3, 9, 11 all the participants are involved in learning through imitation of the same gesture. They actually invite each other to use the shared space which displays a deep interactive manner of learning. Imitation actually takes place within the ZPD showing the level of development at which the imitator is. That is why Vygotsky (1978) considers imitation a key factor for learning because it indicates that the interlocutors are willing to adapt to the immediate context. These findings recall McCafferty's (2002) results, but in a classroom context.

Also with regard to learning, cooperative learning is apparent in extract 2 line 3 in which gesture is a visual phenomenon that helps Tina understand that Darin has a lexical difficulty. This is in tandem with the findings of Harness Goodwin and Goodwin (1986). It also implies that word search is not a pure mental practice, but thanks to gesturing it becomes a perceptible action that addressees can work out. Although Tina provides Darin with the appropriate word before the turn reaches a possible completion unit, her contribution is helpful rather than intrusive because it helps avoid a possible gap if Darin were not provided with the searched-for word. Thus, in alignment with the findings of Gullberg (1998) and McCafferty (2002), the activity changes from a solitary search to a bi-party one in which both interlocutors actively engage in word search. This cooperation is in Krashen's (1982) term a type of 'affective filter' that helps language learning and fluency, which is ostensible in Darin becoming more confident and fluent after being provided with the searched-for word.

The gesture produced by Tina in extract 3 line 7 is also an indication of language learning. It represents the round shape of puri, though she expresses this shape in speech in a later turn (line 10). The smooth transition from gesture to speech shows that the speaker is in a state of language development. McNeill (2005, p. 142) considers this self-mimicry to "be adaptive in 'free' word order situations because it "… ensures smooth speech transitions". This transition may also be apparent in the bi-directional influence of LA and LAlpha. In terms of TFS hypothesis, the gesture produced in extract 9 line 1 demonstrates that Rita might maintain LA TFS pattern while producing the gesture, which is compatible with the findings of Choi and Lantolf (2008), whereas Darin's gesture (extract 6 line 5) shows that her baseline thinking pattern is LAlpha, which reinforces Brown and Gullberg's (2008) findings showing a bi-directional cross-linguistic influence. This diversity implies that gesture as an idiosyncratic phenomenon becomes a linguistic occurrence as the speaker interprets it in terms of linguistic intention marking a transition state.

5.3. Conversational Function of Gestures

5.3.1. Turn-allocating strategy

Similar to the findings of McCafferty (2002) and Goodwin (1981), gestures are found to play an interactional role in turn transfer, a strategy called by Sacks, Schegloff and Jefferson (1974) as 'current speaker select next' because they result sequentially in the non-speakers' contribution in the talk. This strategy demonstrated in the following diagram can be carried out through speech alone, gesture alone or a combination of both.

A: utterance   (1)

    [gestural turn-allocation]

B: utterance   (2)

    Diagram 4: Gesture as a turn-allocation technique

In extract 5 line 6, Rita specifies Zoe as a next speaker through a combination of speech and gesture. That is why no addressee takes the turn before Zoe and no overlap occurs. Another instance showing turn-allocation through gesture alone can be found in extract 2 line 3 wherein

Darin points at Tina to ask for help. That is why no other recipient takes charge of cooperating with word search, which is done by Tina.

In extract 3 Tina specifies her addressees by directing her gestures and her gaze towards all addressees except Rita and Zoe, the reason for which Rita does not take any turn; Zoe speaks only to add some information and most turns are for the other four recipients. On similar lines, Goodwin (1981) showed that the generation of a turn at talk is conducted through eye gaze. In such a case gaze is a request for the recipient to pay attention. Yet, in most interactions in this study the next speaker is specified through adjacency pairs, for example when a current speaker asks a question related to a previous turn (extract 8) the previous speaker is then decided to be the subsequent speaker. Thus speech alone can also have a turn-allocation role.

5.3.2. Gesturing to draw addressees' attention

In any conversation joint attention is a requisite for information exchange. This interactive activity is conducted verbally or non-verbally. In order for speakers to continue their production they need to be aware that their recipients attend to it otherwise they call on different strategies to draw their attention, such as gaze and gestures. For example, in extract 7 lines 4, 7, 9 pointing gestures are shown to be used spatially to hold listeners' attention.

Listeners cannot understand the speaker's message unless they attend to what is being produced. They also tend to produce some backchannel forms such as Ah! (extract 1 line 7), nods (extract 1 line 8) and gaze (extract 1 line 6) to show to the speakers they are tracking what is being said. Therefore, the fact that gestures convey the speaker's communicative intention does not mean that they are performed for the benefit of the speaker only. Gestures are also a listener's phenomenon because if the listener is not able to interpret the gesture then she can misunderstand the message and the speaker can be said to have failed in communicating her intention. Although it is not always the case that a listener interprets a gesture appropriately, this study will not discuss such a phenomenon as this is not part of its aim.

It can be said that gestures in interaction play a communicative role for the speaker as well as for the listener in that they help speakers with the coding/construction of meaning and assist listeners in decoding/comprehending it. McNeill and Duncan (2000, p. 156) contend that gestures are a

means whereby interlocutors respond to their shared world evocatively and interactively. They state that

> "…to have your thoughts come to exist in the form of signs is to cause them to exist in a context of shared practical activities. A sign signifies only for those who 'dwell' in that context. This we can recognize is a recipe for the GP: sign and context are inseparable, and this context must be dwelled in".

In light of this quote, the GP considers gesture as an external display of thoughts that are organized by the speakers in the context of the immediate event. This implies that meaning-making involves the interaction between what is idiosyncratic and holistic (gestures) and what is conventional and analytic (verbal expressions) in a context-specific experience. Therefore, gestures are part of language because they help construct meaning and are part of cognition as they shape thoughts. Meaning is thus interpreted through the interaction between the speaker's communicative intention and her use of context, so much so that meaning involves more than what is literally said. Hence, this interpretation is based on conventional rules to which interactants adhere, and non-conventional individual usage of those norms. Addressees also make sense of what words mean literally and what the message implies. It is thus clear that GP and CA coincide in their analysis of meaning construction.

5.3.3. Gesturing to keep social relations

Another finding discloses the role of gestures in keeping social and spatial relations between interlocutors. This is ostensible in extract 5 lines 3, 9, 11; extract 6 lines 3, 4, 5, 9; extract 7 lines 4, 9; extract 8 lines 11,13,15; extract 9 lines 1,2,3,9,11. In these extracts speakers produce spatial gestures to create a relationship within the shared space.

Many sociologists contend that talk in meaningful interactions shapes the relationship between the participants creating a social bond between them (Scheff 1994). Through talk-in-interaction interlocutors not only exchange experience, skills and lifestyles, but also learn flexibility in accepting each other's attitudes. Imitation of each other's gestures is one of the factors leading to constructing such social relations. The identical gestures of the three participants referring to the same topic in extract 5 indicate the speakers' unconscious accommodation and the impact they

can produce on each other (Carnergie 1937). These are two basic factors behind the creation of interpersonal relations.

Similarly, speech markers such as 'Oh' (extract 5 line 7), 'Look' (extract 6 line 6) and 'Yeah' (extract 7 line 2) also display involvement in the conversation strengthening social ties between interlocutors. Also, pointing gestures are found to involve interlocutors in communication as shown in extract 2 line 3; extract 5 line 6 and extract 6 line 9. The same findings were reached by Krauss, Morrel-Samuels & Colasante (1991) although they deny the functionality of gestures in communication.

In extract 6 line 5 Darin orients her gesture in a way that keeps her within the shared space with her addressee (Nancy), which aligns with Ozyurek (2000) who found that in an attempt to keep social relations, speakers tend to change their gesture orientation when the addressees' location is changed. In dyadic conditions when the speaker said "she throws him out" the gesture performed was to the left of both participants. In triadic conversation the speaker gestured backward, so in both cases the gesture was performed outside the shared space. Thus the way the indexical ground is ordered by the participants constrains the shared social space, maintaining social relations. In terms of GP this implies that the placement and the number of recipients determine the imagery-language dialectic.

To recapitulate, this chapter has provided abundant firm data showing the functionality of gestures in everyday talk of bilingual children. Within this context, gestures are used to fix problems such as speech clarication, add information, compensate for speech, specify the next speaker and build up social relations. The vital question that remains relates to the implications of these findings to the pedagogical setting and the research arena. This will be discussed in the following chapter.

Chapter Six   Implications of the Study

This chapter recalls the most relevant findings of the study and highlights their implications for pedagogical and future research settings. The concluding section will summarize the present research showing its knit structure.

It has been demonstrated that simultaneous bilingual children use gestures to add information that is not expressed in speech, search for words, disambiguate speech, organize discourse structure, maintain social relations and interpret messages. These functions raise the assumption that speech and gestures are tightly linked as they form an inter-connected system wherein gestures help speakers express their conceptual thinking; and assist listeners in their interpretation of received messages. Therefore, the findings of this study go against mainstream theories which pertain that gestures are not communicative, limiting their role in helping with word retrieval (Krauss, Morrel-Samuels & Colasante 1991). Given this link, if speech has many implications to EFL and ESL teaching and learning, so do gestures.

6.1. Pedagogical Implications: Gestures in L2 Classrooms

The main objective of L2 learning is effective communication which involves the ability to produce messages and interpret them. Because gestures sharpen this ability by helping with language comprehension they need to be included in L2 classrooms as well as in curriculums. Although bilinguals are believed to be more competent than L2 learners (Ellis 2005), they also need gestures when learning in order to enhance their communicative competence, particularly when encountering difficulties. In a pedagogical context, gestures are helpful not only for L2 users such as teachers and learners, but also for L2 audiences such as supervisors and school principals. In a recent investigation of teachers' gestures during the elicitation stage in EFL classrooms, Wanphet (2015) found that gestures help with language, pedagogy, classroom management and organization of learners' interactions. Yet, since Wanphet's study confined itself to elicitation, many other rewarding functions of gestures in an EFL classroom context were not studied.

In terms of language, teachers may use gestures to clarify their instructions, highlight particular points, disambiguate spoken expressions, elaborate certain language features especially when

introducing new words, scaffold learners in production tasks, encourage L2 production, and concretize abstract concepts (Hostetter & Alibali 2004) which increases vocabulary retention (Lazaraton 2004) and provides learners with more comprehensible input vital for language acquisition (Krashen 1982). Similar findings were also evidenced by (Hostetter & Alibali 2004)) showing that the visuo-motor constituents of gesturing enhance learning.

Regarding pedagogy, instructors' gestures serve to assess learners' responses, providing gestural feedback. For example, to show a speaking learner that she/he is on the right path a teacher may produce repetitive hand movements asking them to proceed with a certain task. Similarly, to organize students' interactions teachers may gesturally indicate who is to talk first, when and how. They may also display their expectations such as pointing to a word on the whiteboard to demonstrate they expect a learner to use it in his/her production.

Teachers may also gesturally handle learners' behaviour, establishing effective classroom management leading to the minimization of Teacher Talking Time, which promotes learning. For example, a teacher may gesturally draw students' attention to a particular point or ask them to change their seating without hindering the flow of the lesson, particularly since these gestures are easily understood by the learners thanks to their visual nature.

Concerning learners, the output hypothesis contends that learners' production is vital to their perception of new knowledge (Gass & Mackey 2006); and because gestures are part of this production they help with knowledge acquisition. This is evidenced by Gullberg (1998) whose findings showed that children who gesture during problem negotiation learn more than those who do not.

Indeed, gestures are for learners helpful expressive sources through which they can silently communicate while organizing their thoughts. In silent moments, gestures can be used to compensate for speech, reducing frustration which results from silence. Learners use gestures for peer or self-correction as well as for scaffolding each other in collaborative activities wherein more-gesturing learners help less-gesturing ones. Likewise, learners may obtain more discourse knowledge by producing similar gestures to keep talking on the same topic. Gestures also help L2 learners activate target words in their mental lexicon during word search, enhancing their self-confidence and L2 authentic use. Like teachers, learners gesture to clarify their speech,

identify difficult words, concretize abstract objects and ask for things without obstructing the flow of the lesson. Furthermore, considering Lakoff and Johnson's (1980) argument that conceptualization is enhanced through the use of metaphors, when they perform metaphoric gestures, L2 learners may build up their competence in conceptualization.

In socio-cultural terms, since metaphors are culturally shaped, metaphoric gestures help learn the culture of the target language which is crucial for language acquisition. Furthermore, through gesturing during different in-class and out of class activities, learners maintain social bonds. These interpersonal relations also promote learning by creating a sense of belonging and social solidarity. Indeed, having these feelings students are more likely to cooperate with their peers.

In terms of input, gestures not only provide teachers with information about learners' present understanding of the tasks, but also inform them about what they have learnt and what they have not. Teachers would then rely on such a transition stage to build up future activities. Furthermore, learners' gestures are as indicative as teachers' gestures of their psychological state. Mutual understanding of each other's mood through gesturing may result in a particular behaviour compatible with that mood. This may be considered as an affective filter which promotes learning. By attending to teachers' gestures learners may also be informed about teachers' expectations and intentions. They then rely on such information in adjusting their production.

Given these positive effects of teachers' gestures on L2 teaching and learning, teachers' training and professional development programmes need to include gestures as deployed by native speakers. However, they need to be attentive about gestures that infringe learners' cultural and social rules, particularly given that students tend to imitate teachers' gestures (Le Baron & Streeck 2000), which enhances learning, as discussed in chapter 5. The other stakeholders that may benefit from these findings are supervisors, school principals, parents and policy-makers. As observers, gestures make it possible for them to interpret the conveyed information more comprehensively. They also help parents to assist their children in homework and extra-curricular activities. As for policy-makers, they may build on the findings of this research to take decisions about including gestures in curriculums and syllabuses, which would ensure more successful teachers' application.

To conclude this section, it is worth mentioning that the findings of this study help to understand language use by simultaneous bilinguals, which may or may not be found in L2 classrooms because these two groups (simultaneous bilinguals and L2 learners) have different levels of language proficiency. However, some elements are similar because these two groups are still under linguistic development. Besides, CA itself is a powerful analytic method that may contribute in enhancing language acquisition because it deals with individual practices that may help identify various learning styles.

6.2. Limitations of the Study

The study was confined to a single gender, due to the cultural issues mentioned in chapter 1. Yet, Ellis (1994) presents much research positing that girls outpace boys in L2 learning at various school levels. In this case, if speech and gesture are tightly linked, then girls might also outperform boys in L2 gesture production. This might be an issue for further research.

Another shortcoming is that since gestures are multifunctional, many hypotheses need to be assumed in explaining their functions (McNeill 2005). However, evidence collected from natural interactions may back up one assumption over others, the main reason behind the requirement of caution in applying the findings of this study in other contexts. Gestures have been studied in a specific sequential context of a particular type of interaction between particular bilingual children. Therefore, what applies to the participants of this study may not apply to others, which is why Schegloff et al. (2002) argue that it is not possible to apply such findings in a new setting without studying if similar behaviours are adopted to carry out similar actions in that new situation. Also, since this research limits itself to simultaneous bilinguals whose gestures probably differ from late L2 acquirers, its replication might yield different results even if applied in a similar context.

6.3. Future Research Possibilities

Unlike applied linguistics, CA findings do not aim to provide answers to theoretical assumptions liable for generalization. However, they may be a starting point for applied linguists to take this study further for future research. The recent movement in integrating CA and ethnography (Cresswell 2013) makes it possible for this study to be superseded by an ethnographic replication

of data to investigate the socio-cultural context wherein these gestures are produced, or the relationship between gesture and speech through the examination of the function, meaning, locus and phases of gestures.

Data can also be triangulated by adding two other data collection tools such as questionnaires and post-observation conferences in order to conduct an experimental quantitative investigation. It is a research that determines the influence of a particular phenomenon on particular subjects. Such a study is adequate for the examination of the effect of social factors on LAlpha speakers' gestures. As Gullberg (2010) suggests, this requires a comparison of speech-gesture practices in a specific task in LA as a control situation, with the same practices of the same participants using LAlpha as a target condition. Other typologically similar investigations may study the influence of linguistic proficiency on bilingual children's gestures (Gullberg 2010).

On another line, this study confined itself to a single gender data. Future studies may build on this shortcoming to conduct similar studies that will investigate mixed gender talk or bilingual boys' talk. The findings may also provide new directions for future research such as studying lingua franca/Creole talk as these people have the same linguistic capability as the participants of this research.

6.4 Professional Impact

This investigation has highly impacted the researcher from different perspectives. In terms of subject knowledge, the researcher has gained insights into how people, and more particularly bilingual children, gesture and how these non-verbal practices increase learning. Of significance is the knowledge gained about the configuration of gestures and their phases. In terms of research skills, in spite of the many studies conducted before by the researcher using various methods, CA is a new practical approach that has enriched her previous knowledge and abilities. The variety of reading about this method has enriched her intellectual skills about the organization of natural talk. Within the same paradigm, the researcher has enhanced her capacities in using online resources, collecting data in social contexts and handling information.

At the personal level, new knowledge has been obtained through discussions with such an encouraging and meticulous supervisor. It is a type of incremental learning generated from

ongoing appraisal and rectification. Enhancement of flexibility, self-confidence and perseverance are also corollary results that might affect the researcher's future similar investigations.

6.5. Conclusion

This study was conducted to investigate how bilingual children gesture and the sequential environments of their gesturing. It adopted CA approach for data collection. Data were drawn from videotapes of participants' everyday talk. Six simultaneous bilinguals were observed during natural interactions, and then data were transcribed, analysed and discussed.

Chapter 1 set the scene for the whole study showing its significance within the gesture research field. In chapter 2 a bulk of observational and experimental studies showing the role of gestures in communication were presented. The third chapter explained the adopted theoretical approach providing explanation of how data would be analysed. In light of this method, chapter 4 analysed the findings which were discussed in the penultimate chapter. The implications of these outcomes have been discussed in this final chapter.

The results of the current investigation showed that bilingual children produce gestures for three main purposes, 1) to solve problems in talk (i.e. disambiguate speech, explain concepts and search for words), 2) to organize discourse structure (i.e. regulate turns at talk, maintain thematic unit), and 3) to organize social relations (i.e. maintain relationship between interlocutors, draw recipients' attention). Furthermore, the functions of bilingual children's gestures are underpinned by participants' reaction located in preceding or subsequent turns. This phenomenon was demonstrated in 5.1., which shows how the functions of gestures are understood in terms of speakers' production and listeners' interpretation of that output.

In general, this study shows that successful communication is underpinned by competent linguistic and pragmatic practices where gesture production and interpretation are as vital as those of speech. It has attempted to contribute to the controversy about gesture-speech relationship, based on the functional role of gestures in communication. It is hoped that educational stakeholders, particularly in the UAE, including policy-makers, curriculum designers, teachers, learners and parents will consider the role of gestures in language acquisition.

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Appendix

January 1, 2016

Dear Parent:

I am Jalila Abdurrahman Sfaxi, a master student at the British University in Dubai. I request permission for your child to participate in a research study to be used for my master dissertation. I am conducting a research project on how gestures help bilingual children communicate using English as a second language.

The study consists of the following activities:

1. Your child will take part along with other children in video-recordings.
2. These recordings include children playing and conversing using English.
3. Children's gestures will be recorded then analysed.
4. The video-recordings will be kept with me, as a researcher and nobody will see them.
5. Children's names will not be revealed in the research.
6. You can withdraw your permission at any time before data analysis.
7. Six children will participate in the study including your child and mine.
8. Some pictures of the children during the interaction will be included in the study.
9. Only Dr. Lang, my supervisor and I will have access to recordings.
10. Participation in this study is voluntary.
11. Even if you give your permission for your child to participate, your child is free to refuse to participate.
12. If your child agrees to participate, she is free to end participation at any time.
13. Should you have any questions or desire further information, please feel free to contact:

Ms. Jalila Abdurrahman

Principal Investigator

sfjal@yahoo.com

Please indicate whether or not you wish to allow your child to participate in this project by checking one of the statements below, signing your name and returning it to me.

_____ I do grant permission for my child to participate in Ms. JalilaSfaxi's study of Gestures in Bilingual Children's Communication.

_____ I do not grant permission for my child to participate in Ms. JalilaSfaxi's study of Gestures in Bilingual Children's Communication.

Signature of Parent/Guardian

_____

Date

_____

B. Table of Abbreviations

APP   Adjacency pair parts

BLA   Bilinguals' language acquisition

CA   Conversation Analysis

GPT   Growth Point Theory

IPH   Information Packaging Hypothesis

LA   Language A

LAlpha   Language Alpha

L1   First language

L2   Second language

LRT   Lexical Retrieval Theory

SFL   Satellite-framed languages

SLA   Second Language Acquisition

SLD   Second language development

TFS   Thinking for Speaking

TRP   Transition relevance place

ZPD   Zone of Proximal Development

BUiD   The British University in Dubai

EFL   English as a Foreign Language

ESL   English as a Second language

UAE   The United Arab Emirates

VFL   Verb-framed languages