How Language and Culture Shape Gesture in English, Arabic and Second Language Speakers

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Dedication

This to You up there, and in here…

Without you, this would not have been possible.

Acknowledgement

In this section, I felt it is necessary to acknowledge the ones who are partially responsible for this accomplishment. This has become possible due to the significant roles they played in supporting and encouraging me.

With a heart full of gratitude, I would like to thank my mother Zohoor for having faith in me and in my capabilities. I am grateful for her unconditional love, prayers and unlimited support. She is my biggest inspiration to succeed. I truly love her. Because of her, I am here now.

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Then, I would like to express my appreciation to my beautiful sisters Maha, Lubna, and Sara and my brothers Mohanned and Hosam. I am grateful for all of their love and their emotional and physical support. I also would love to thank Deema, my niece for being my special endless love source.

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Abstract

This research project sheds light on how language and culture can shape gestures with certain gesture features. It consists of two studies: a cross-cultural study and a second language study.

In the cross-cultural study, gestures of a group of the English speakers and a group of the Arabic speakers were compared in term of certain gesture features: expression of motion events, dual gestures, use of gesture space and gesture rate. Gestures were elicited through narrations of the Tomato Man video clips. It was found that English speakers produced more conflated gestures than the Arabic speakers. It was also found that the English speakers produced fewer dual gestures than the Arabic speakers. Moreover, it was found that the English speakers produced fewer representational gestures and used smaller gesture space than the Arabic speakers.

In the second language study, gestures produced during the Arabic and English descriptions of the Arabic early learners of English were compared within subjects. The same methodology was applied. It was found that the speakers produced more conflated gestures while speaking L2 English than while speaking L1 Arabic. It was also found that they produced more dual gestures while speaking their L2 English than while speaking their L1 Arabic. Regarding the use of gesture space and gesture rate, there was no difference between L1 Arabic and L2 English.

It is concluded in this research project that Arabic is predominantly a verb-framed language which also uses other styles to express manner and path than its own. It is also suggested based on the results that ecology and cultural interaction might have an influence on shaping gesture. Furthermore, it is also agreeing with previous literature that language can shape gesture through thinking for speaking and establishing habitual thinking. This research project is also in line with previous research regarding how L2 gestures can be shaped by

language through thinking for speaking and by the communicative demand and the difficulty

to produce L2 speech.

Table of Contents

Table of Figures

Chapter Four Figures

14

Chapter One: Introduction

A married couple is engaged in an apparently happy conversation about their dog for an experiment at the psychologist John Gottman's laboratory at the University of Washington (Gladwell, 2005). After fifteen minutes, Dr. Gottman states that their marriage is not in a healthy state and that it will not last. His student Amber Tabares who has been trained by him explains his assertation by referring to various aspects that have helped him to make such a judgment within so little time, such as the choice of words, voice tone and, probably, more interestingly the couples' body language. For example, while the husband was talking, the wife, more than once, "rolled her eyes very quickly, which is a classic sign of contempt" (Gladwell, 2005).

It is fascinating how our non-verbal behaviors can communicate information to others without even speaking, and how we understand what has not been stated verbally through them. Nevertheless, what might be even more interesting is when these nonverbal movements are produced along with speech, and united with it in producing a whole, meaningful utterance. These nonverbal behaviors, called 'gestures' in this research project, are defined as movements that carry information that is related to the speech they are produced with (McNeil, 1992; Kendon, 1980). They are meaningful and convey a message such as expressing what has not been verbally stated, stressing or illustrating it (McNeil, 1992; Kendon, 1980; Kendon, 2004). The relationship between speech and gesture is discussed in more detail in chapter two in sections 2.2, 2.2.1, 2.2.1.1 and 2.2.1.2.

The importance of gesture can be explained through its significant communicative functions. Speakers seem to use gesture intentionally for communicating a message (Cohen, and Harrison, 1973), and in cases when they can see their addressees, they provide further gestural descriptions (Emmorey, and Casey, 2002). These are discussed further in chapter two in section 2.3.1.

Gestures also play a significant role in cognition. Speakers' use of gesture lightens the cognitive load, which allows them to perform another task more sufficiently/effectively (Golin-Meadow, Nusbaum, Kelly, and Wagner, 2001). Moreover, using gestures facilitates accessing lexical items in the speaker's mind (Rauscher, Krauss and Chen 1996). Further, gesture has a significant function regarding planning speech production conceptually (Alibali, Kita, and Young, 2000). These cognitive functions are explained in detail in chapter two in section 2.3.2.

The first study

In this section, the first study of this research project is introduced. The topics to be investigated in it will be introduced here along with some of the studies upon which it is built.

It is common knowledge that gesture exists in all cultures. As far as I know, there are no reports of a culture that does not have gestures. However, these gestures differ cross-culturally. In interacting with people from diverse cultures, one might notice this difference. This can be seen in conventionalized gestures called 'emblems'. 'Emblems' are gestures which are meaningful on their own without accompanying speech (Kendon, 2004; McNeil, 1992), and are discussed later in chapter two in section 2.2. For example, "the fingers crossed" emblem in which "the middle finger is twisted over or around the forefinger" (Morris et al., 1979: 16) can be seen in some areas around the world such as Europe and the British Isles. It has a Christian origin and it also means good luck, to defeat bad luck or to cancel a lie (ibid). However, except for Tunisia, where the gesture has a similar meaning, it is not used in the Arabic countries, and it is not even meaningful there.

Sometimes the same gesture exists in diverse cultures but has a different meaning in each. This can be seen in "the hand purse gesture" in which the thumb and the rest of the fingers of a hand are aligned and drawn together (Morris et al. 1979: 44). Although this emblem is used in many areas, mainly in Europe and the Mediterranean region including

Tunisia, its meaning differs from one area to another. It means 'query' for Italian speakers in Italy and around the world. In Corfu, which is an island near Italy, Greece and Turkey, it means 'good'. It is used for criticism in Malta. It means 'slowly' in Tunisia. In Belgium, it is used to express fear. In Spain, this gesture predominantly means 'many' (ibid). As a Saudi Arabic speaker, when this gesture is used in my culture, it means 'slowly', but it can also mean 'wait'. Thus, the meaning of a single emblem can differ cross-culturally.

In addition to emblems, gestures produced with speech also differ across cultures. These gestures differ in terms of properties such as the degree of the complexity (Efron, 1972, Kendon, 2004), of body parts involved in performing them (Efron, 1972), their size (Kendon, 2004), referring to to-the-right and to-the-left relations (Kita, Danziger, and Stolz , 2001) and the way they express spatial components such as manner and path (Kita, and Özyürek, 2003). These differences are discussed further in Chapter Two in sections 2.4, 2.4.1, 2.4.2, 2.4.3, 2.4.4 and 2.4.5, and in Chapter Three. Cross-cultural differences in features of gestures may result from particular factors, some of which are mentioned briefly next.

Thinking for speaking (Slobin, 1991) can cause differences in gestures across cultures. Thinking for speaking means to organize the thoughts that are consistent with the language for the aim of speaking (Slobin, 1987, 1996). Speakers express spatial components such as manner (the way and object moves) and path (the direction the object is moving towards) in their speech according to their language typology (Talmy, 1985, 1991, 2001; Slobin, 1991). This directly affects the way these speakers gesturally convey spatial elements (Kita and Özyürek 2003).

Languages are classified into two types regarding how they express spatial elements such as manner and path; satellite-framed and verb-framed (Talmy, 1985, 1991, 2001). Satellite-framed languages' speakers predominantly express the manner in the main verb and

the path in a satellite. Verb-framed languages' speakers express the path in the main verb and the manner in an adverbial or in another verb.

According to Talmy (2007)'s typology, Arabic is a verb-framed language. However, this is controversial territory. That is because although there are supporting studies (Almurshidi, 2013), there are claims that it is not a verb-framed language (Saidi, 2007). These studies are discussed in further detail in Chapters Two in section 2.2.4, and three in section 3.1.1.1.

This research project explores and investigates how motion events are expressed by Arabic speakers in speech. Arabic gestural expression of motion events is an area that has not yet been studied. Hence, this is also examined in this research. This will be accomplished by using stimuli made specifically for this purpose. Motivations are discussed further in Chapter Two in sections 2.2.4 and 2.6.1, and in Chapter Three in section 3.3.1.

The Whorfian effect is another factor that can lead to a cross-cultural difference in gesture. The Whorfian effect is one of the ways through which language can have an influence on thinking (Whorf, 1997). This effect occurs when language establishes habitual thinking in the minds of its speakers. This habitual thinking can be seen in the gestures of these speakers even when the causal linguistic elements are not verbally expressed (Haviland, 1993; Levinson, 2003; Majid et al., 2004). This is discussed in more details in Chapter Two in sections 2.4.3 and 2.6.1, and in Chapter Three in sections 3.1.1.2.

This research project investigates gestural evidence for this the Whorfian effect. This is achieved through examining the effect of the grammatical dual form used in Standard Arabic on gesture. The grammatical dual form is used to express the meaning of two-ness (Alhashemi, 2017). This is because this form is no longer used in informal Arabic. If this grammatical rule is not used in the speech of Arabic speakers while speaking informal Arabic, yet it is demonstrated in their gestures, then this effect might be a Whorfian effect. In

other words, I will examine whether the concept of dual-ness manifests itself in Arabic speaker's gestures even though they are speaking informal Arabic, in which grammatical dual forms are not used at all. If dual gestures (gestures that are produced to express the concept of two-ness) are used by the speakers of informal Arabic more than the speakers of English, then this might be a Whorfian effect. This means that it might be the influence of the habitual thinking established in the minds of the speakers of informal Arabic and is expressed in gesture though they are not using Standard Arabic in their speech. So, dual gestures here are used as evidence for the Whorfian effect. Thus, the current study aims to provide additional gestural evidence for Whorfian effect to Majid et al.'s (2004) study.

Ecology is another factor that might have an influence on variation in gesture across culture. Ecology includes the surrounding environmental constituents and circumstances of the speaker. It has been suggested that the ecology of the area in which communication occurs may affect the gestures that are produced in it (Efron, 1942, 1972; De Jario, and Kendon, 2000; Kendon, 2004). One way through which this could be possible is how the circumstances of the communication can influence the speaker's selection of which communication modality to use (Kedon, 2004) based on Hymes, (1974). For example, if the area surrounding the communication is too noisy, then perhaps speakers tend to use more gestures or even emblems. Such ecological circumstances are suggested to have effect on certain gestural features such as gesture rate as well as the use of gesture space (Kendon, 2004).

Coming from a Saudi Arabic culture, I noticed this kind of difference when I started interacting with English speakers in the United Kingdom. From observation, I noticed that I gesture much more than my English interlocutors do. I also became aware of how expansive my gestures are compared to theirs and I began to modify the size of my gestures, trying to make them smaller while conversing with English speakers. However, these are only my

observations. There is no substantial, quantitative study in the literature regarding the frequency and size of Arabic gestures. These are, therefore, investigated in this research project through a comparison between English and Arabic gestures. If Arabic speakers are surrounded by a similar ecology as Italian speakers, perhaps they will have similarities in terms of gesture space and gesture rate.

Geographically, the Arab world covers a considerable area of the map of the world; the land it covers is estimated to cover 12.9 million square kilometers. It extends "from the Atlantic Ocean in the west to the Arabian Sea in the east, and from the Mediterranean Sea in the north to the Horn of Africa and the Indian Ocean in the southeast" (AMBergh, 1998). It includes twenty four states. It has a large population, approximately 325,000,000 people. Historically, it has been through several eras, ruled by previous empires and colonized by many foreign countries such as the British colonization in Kuwait (Salibi, 1980). These geographical and historical factors may have played a significant role in influencing the Arabic language and enriching the Arabic culture.

Given these facts, and looking at the amount of research of Arabic gestures that exist in the literature today, the use of gesture by Arabic speakers is an area in gesture studies that has not received enough attention. Only a few research studies have investigated Arabic gestures, most of which are descriptive such as Barakat (1973).

This research project investigates Arabic gestures to further our understanding of Arabic speakers' use of gesture. It also provides a clearer picture of their properties qualitatively and quantitatively. This is done through a comparison of English and Arabic speakers.

This research project focuses on Arabic for the following reasons. Firstly, it has been shown earlier (two paragraphs above) that the existing research on Arabic gesture is considered to be limited. Secondly, it has also been seen how Arabic gestures have not been

investigated regarding gestural expression of spatial components considering that there is controversy concerning Arabic being a verb-framed language. Thirdly, an Arabic gesturer may be a perfect specimen for investigating the theory that being surrounded by similar environmental elements can cause similarities in gesture. This is due to two reasons. The first reason is that previous studies provided information on Italians' use of gesture space and gesture rate (Kendon, 2004Barzini, 1964; Kendon, 1992, 1995). The second reason is that Arabic speakers and Italian speakers seem to share similarities regarding ecological circumstances (De Jorio, and Kendon, 2000; Kendon, 2004; Ziegler, 2017), and have shared cultural interactions (Morris, 1979; Metcalfe, 2009). As a result, they might have similarities with Italian speakers' use of gesture space as well as gesture rate. Perhaps similarities in gesture features between them support the suggested theory that ecology and cultural interaction may have an influence on gesture. Further, Arabic gesture has not been examined in terms of these gesture features. Fourthly, Arabic may be perfect for investigating Whorfian theory. This is because Standard Arabic has a grammatical dual form (which is the grammatical form used to express the meaning of two (Alhashemi, 2017) that disappears in informal Arabic. Whether this effect is shown in the Arabic speakers' gestures or not will be investigated.

Arabic gestures are compared to English gestures in this study for four reasons. First, regarding expression of manner and path, comparing languages with different language typologies will make differences stand out clearly. Since Arabic is argued to be a verb-framed language (Talmy, 2007; Almurshidi, 2013), and English has already been established to be a satellite-framed language (Talmy, 1991), English is used in this study as an ideal satellite-framed language to be compared to Arabic.

Secondly, concerning dual gestures, unlike Arabic, English does not have the grammatical dual form. Therefore, in this study, English represents an ideal language that does not have this form to be compared with Arabic.

Thirdly, concerning the use of gesture space, English speakers have been noted to make smaller gestures than Italian speakers (Kendon, 2004). According to my personal observations mentioned earlier, Arabic generally uses more gesture space than English speakers. Therefore, when comparing the use of gesture space of English and Arabic speakers, differences should be clear. Moreover, my observations will be tested using quantitative methods.

Fourthly, with respect to gesture rate, English has also been observed to be a language of low gesture frequency (Graham, and Argyle, 1975). I, personally, observed that Arabic speakers tend to produce more gestures than English speakers. So, Arabic here is compared to an ideally low-rate-gesture language. This should allow the differences to stand out.

The Arabic participants in this study come from Saudi Arabia. This choice was based on the following points. Firstly, they speak Arabic. Secondly, the Arabic language originated from the Arabian Peninsula (AllifBaa, 2004), which is occupied by Saudi Arabia. Thirdly, Saudi Arabia has a central location in the Middle East, so Arabic speakers from Saudi Arabia are used here as a sample that perhaps can to an extent represent Arabic speakers generally, and specifically Arabic speakers in Gulf countries. Fourthly, it is surrounded only by Arabic countries, which may lead to more purity regarding the Arabic language.

The English speakers in this study come from England. This is for the following reasons. Firstly, the focus of the study is on British English. Secondly, English originated from England (https://www.merriam-webster.com/help/faq-history, 2017). Thirdly, research questions are motivated by and built on studies in the literature that investigated British English such as Kendon's (2004) study.

Thus, this research project investigates the cross-cultural differences between gesture in English and Arabic speakers with regard to expressing manner and path, dual gestures, use of gesture space and gesture rate. The research questions of this study are stated below.

Research questions in the cross-cultural study:

1. How do native speakers of English and Arabic differ in terms of their use of speech-accompanying gestures involved in the syntactic packaging of manner and path?

2. How do native speakers of English and Arabic differ in terms of their use of dual gestures, which are gestures indicating the concept of two?

3. How do native speakers of English and Arabic differ in terms of their use of gesture space?

4. How do native speakers of English and Arabic differ in terms of their gesture rate?

These questions are addressed in the first study of this research project. In order to investigate them, a particular methodology was selected. A story-retelling task was used to elicit the relevant gestures to be examined. This task has traditionally been used in previous gesture studies and has been shown to be effective (Berman, 1988; McNeill, 1992; and Kita, and Özyürek, 2003)

The Tomato Man and the Green Triangle clips were used as the stimuli for this study (Özyürek, Kita, and Allen, 2001). These video clips were specifically chosen because they contain the types of events that can stimulate gestures relevant for this study. This is discussed further in chapter three in section 3.3.1.3. A mixed research approach, combining quantitative and qualitative methods, is used in this study. This is discussed further in Chapter Two in section 3.2.1.

The second study

In this part, the second study of this research project is introduced. It brings in the topics to be investigated in it as well as some of the studies upon which it is built.

In addition to the crucial roles gesture generally plays in communication and cognition, when specifically used by second language learners, this role perhaps becomes even more significant. The importance of gesture in second language learners is briefly explained below in respect of their communicative and cognitive functions.

Second language speakers use gesture to aid their L2 speech in order to communicate better. They use gestures strategically to overcome problems such as disfluency (Gulberg 1998). They also use gestures for replacing missing words and complementing speech (Gulberg 1998; Olsher; Mori and Hayashi 2006). Further, second language learners use gestures to make their discourse more coherent by employing them for anaphoric reference (Gullberg, 1998, 2003, 2006; McCafferty, 2004). These communicative functions of gestures in second leaners are discussed further in chapter two in section 2.5.1.1, 2.5.1.1.1., 2.5.1.1.2 and 2.5.1.1.3.

Besides their communicative functions, second language learners use gestures for cognitive functions. They can employ them as self-regulators (Platt and Brooks 2008). They also use them to organize their thoughts (Gulbreg 2006). Moreover, gestures can also be used as a sign of development in second language learning as they underlie the cognitive processes in the minds of second language learners (Goldin-Meadow, 2005; Gulberg, 1998; Stam, 1998, 2006). These cognitive functions are discussed in detail in chapter two in sections 2.5.1.2, 2.5.1.2.1 and 2.5.1.2.2.

Gestures accompanying the speech of second language learners have certain features. These features might be caused by certain factors. Some of these are briefly discussed below.

Gestures employed by second language learners can be affected by their first and second languages. Gesture features in their first language can be transferred across to their second language. For example, it has been noted that gestures of intermediate and advanced learners have shown influence of their first language while expressing motion events (Stam, 1999; Yoshioka, and Kellerman, 2006). However, to the best of my knowledge, second language learners with a lower level of proficiency have not been studied yet. This research project investigates how Arabic early learners of English express motion events gesturally. This is explained further in chapter two in sections 2.5.2.2 and 2.6.2.

Another factor that may affect gesture features in second language learners while speaking L2 is being under high communicative demand. Being in such a situation, L2 speakers' gestures may become more informative (Gerwing, and Bavelas, 2004). If this is true, then perhaps while expressing dual events, in which two characters perform an action together while playing the same role, L2 gestures may show this concept more than L1 gestures. This is examined in this research project. Further details on this will be discussed later in chapter two in section 2.6.2, and in chapter four in section 4.1.2.2.1.

Moreover, higher communicative demand influences gesture space and gesture rate. It is expected that second language learners with low L2 proficiency go through such pressure during their L2 speech. Would that affect their L2 gesture space and gesture rate? This is also examined in this research project and is explained further in chapter two in section 2.6.2., and in chapter four in sections 4.1.2.2.2 and 4.1.2.2.3.

So, the current research project also examines gesture in Arabic early learners of English in terms of certain properties; gestural expression of manner and path, dual gestures, use of gesture space and gesture rate. These gesture features are looked at in the light of factors that shaped them. This is accomplished through a comparison between gesture

properties in their first language (Arabic) and their second language (English). The research questions of this study are listed below.

Research Questions in the second study

1. How do speakers vary in their use of manner and path gestures when they are speaking their first language (Arabic) and their second language (English)?

2. How do speakers vary in their use of dual gestures when they are speaking their first language (Arabic) and their second language (English)?

3. How do speakers vary in their use of gesture space when they are speaking their first language (Arabic) and their second language (English)?

4. How do speakers vary in terms of their gesture rate when they are speaking their first language (Arabic) and their second language (English)?

To investigate these research questions, the same methodology used in the first study was also chosen to be used in this study. This is because this study is built on the methodology and results of the first study. Moreover, because the same gesture features examined in the first study are also investigated in this study, the re-telling task of the Tomato Man and the Green triangle video clips is again suitable here for it is more likely to elicit gestures which are relevant to this study.

Gesture features of Arabic early learners of English are investigated in this study for the following reasons. Firstly, as this second language study is built on the first cross-cultural study, gestural repertoires of the speakers' first language regarding the features under study are provided by the first study. Second, gesture features of Arabic leaners of any level of English is an area to be explored.

Thus, this research project consists of two empirical studies. The first one is a cross-cultural study in which certain gesture features in English and Arabic are compared. The second one is a second language study. It examines gesture features of Arabic early learners of English through a comparison between their first and second language. In the two studies, features of gestures are examined with relevance to factors that might have caused them.

Outline of chapters

This thesis is divided into five chapters. The current chapter is an introduction, which provides the overview of the dissertation.

Chapter Two is a literature review. It reviews the literature relevant to the two studies. It starts by providing the reader with the terminology and definitions essential to this research project. It also discusses gesture types and their relationship to speech. It then explains communicative and cognitive functions of gestures in more detail. The cross-cultural differences in gesture properties and the factors causing them are presented next. The importance of gesture in second language learners through their roles they play in communication and cognition is demonstrated. The focus then highlights gesture features in second language learners and the factors influencing gesture. Throughout the literature review, gaps in the literature relevant to this research project are highlighted. Next, the reader is provided with the theoretical framework along with the research questions of the two studies. The chapter ends with a note on the mixed research approach.

Chapter Three presents the first empirical study; the cross-cultural study. It begins by introducing the reader to motivation for the study concerning all the gestures features to be examined, and to the factors shaping gesture. After reviewing gesture features and causal factors, the research questions are presented. The reader is then taken more deeply into the methodology used to investigate the research questions including the task, details of the stimuli, participants and procedures. Then, the results of the study are presented

quantitatively along with detailed descriptive examples. These results are discussed in the light of the existing literature, new contributions and implications. The final section in this chapter is a conclusion.

Chapter Four presents the second empirical study, namely the second language study. It begins by highlighting the motivation of the study concerning properties second language learners' gestures to be examined and their factors influencing them. As this section unfolds, it presents the research questions. Next, the reader is provided with the methodology used to investigate the research questions. The results of this study are then introduced quantitatively and qualitatively. The reader is presented with a discussion of these results including relating them to the existing literature, contributions and their meanings. It ends with a conclusion section.

Chapter Five is the final chapter of this thesis. It presents to the reader a general discussion and conclusion of this research project. It consists of key findings. Throughout that, results are discussed in a larger scale. General contributions of the two studies and new knowledge brought about by this research project are discussed. Finally, a general conclusion of the whole thesis is presented.

Chapter Two: Literature Review

2.1 Introduction

This chapter reviews the literature related to the ways culture and language shape gesture use in first and second language speakers. It has six main sections with smaller subsections. It starts by shedding light on the terminology and definitions of gesture including its types highlighting the types relevant to this research project in sections 2.2, 2.2.1 and 2.2.1.1.

Then, the reader's attention is drawn towards the importance of gesture by presenting the strong relationship between gesture and speech in section 2.2.1.2. After that, the role gesture plays in communication and cognition is highlighted in order to show the importance of gesture in sections 2.3, 2.3.1 and 2.3.2. Then, the reader's attention is turned into the factors that might play a role in shaping gestures with certain features causing gesture features to differ cross-culturally in section 2.4 and its subsections.

After that the reader is presented with the roles gesture plays in the second language (L2) discourse by highlighting the communicative and cognitive functions of gesture when used by L2 leaners in section 2.5.1 and its following subsection. Then, the reader's attention is turned towards the factors that might play a role in shaping L2 gestures with their specific features in section 2.5.2 and its following subsections. The 2.6 sections are on the theoretical framework of the project and the research questions.

2.2 Gesture

It is necessary at the beginning of this thesis to present the definitions of the terms that are in relation to the main topic of this research project. This section highlights the meaning of gesture, its types and its relationship to speech.

Forms of non-verbal behavior can be categorized into different types according to the relationship between the non-verbal behavior and speech. An example for such categorization is Kendon's (1988) classification of gestures. In this classification, McNeill (1992) arranged Kendon's gesture types along a continuum, which he called 'Kendon's continuum'. Gestures on one side of this continuum are produced side by side with speech in 'gesticulation'. This relationship dissolves gradually towards the other end of the continuum till it reaches its zero point in 'pantomime' (McNeill, 1992). Along Kendon's continuum, a number of different kinds of gestures are recognized. They are explained here briefly. See Figure (1) below.

Gesticulation ➔ Language-like Gestures ➔ Pantomimes ➔ Emblems ➔ Sign Language

Figure 1: Kendon's continuum (McNeill, 1992; Kendon, 1983; Kendon, 1988)

The first kind, gesticulation, is a movement that embodies a message in relation to the speech accompanying it. It is mainly made with the hands and the arms (McNeill, 1992). For example, a speaker raises his hand up while saying "and he climbs up the pipe" (adapted from McNeill, 1992). However, gesticulation is not restricted to hands and arms; other body parts can also be used to gesture if the hands or arms are immobilized or occupied. For example, the head can be employed as a third hand for pointing. Feet and legs can also be used for gesturing (McClave, 2000).

Language-like gestures come second on the continuum. These gestures are constituents of the grammatical structure of a sentence. This means that they occupy grammatical slots in the sentence the way words do. For example, a speaker says "Sylvester went", and then performs a gesture of a flying object (adapted from McNeill, 1992). The gesture in this example completes the grammatical structure of the sentence (ibid).

In pantomime, speech totally disappears. It is considered a silent show with no speech. It consists of a single gesture or a succession of gestures. It is usually performed for the purpose of narrating story (ibid).

Emblems are next on the continuum. They are signs that are conventionalized. They can be expressive on their own without any accompanying speech such as the ring gesture that means 'OK' where the tips of the index finger and the thumb touch forming a circle (ibid).

The last one on the continuum is sign language. Sign language is a language that has no speech (Kendon, 2004). It counts on the kinesic medium.

This research project focuses only on speech-accompanying gestures. Out of all the kinds of gesture along the above-mentioned continuum, gesticulation and speech-linked gestures are the only kinds that are connected to speech, and are produced along with it. Therefore, they are the kinds of gesture that will be referred to throughout this research. For that reason, the definition of gesture used in this study includes the two kinds.

Gesture is defined here as a movement that embodies a message that is related to the speech accompanying it, and it can complete the grammatical structure of a verbal sentence by occupying a grammatical slot nonverbally. It is discussed in detail in the following sections regarding their relationship to speech, how the contribute to its meaning, and their types.

2.2.1 Speech-accompanying gestures

While we speak, we gesture spontaneously. Gestures accompanying speech seem to be a phenomenon in several cultures. Speech and gesture unite to form one single system. They are connected to one another temporally (McNeill, 1992: 23). Such unity can be seen in how speech and gestures are co-expressive pragmatically and semantically. Speech-

accompanying gestures express closely related content if not even the same and bring about the same pragmatic functions (McNeill, 1992). Examples on how gestures express related meaning to that of speech are provided in the following section 2.2.1.1.

Further, development of speech and gesture together in children as they grow indicate that speech and gesture work together as a whole integrated system. Children's gestures develop gradually as they grow from pointing to concrete objects through different stages until they are able to point to abstract ideas. Speech also develops in children in the same way. They move from referential focus in talking gradually until they become able to construct discourse (McNeill, 1992). Also, in aphasia, speech and gestures break down altogether (McNeill, 1985). Moreover, Speech and gesture breakdown in parallel in case of disfluency (Gullberg, 1998; Seyfeddinipur, 2006) or in stuttering (Mayberry, and Jaques, 2000).

2.2.1.1 Types of co-speech gesture

Gesture accompanying speech has been classified according to their meanings, relationship to speech and shape into five major types; iconic, metaphorics, beats, cohesive and deictics (McNeil, 1992). Iconic gestures refer to gestures that are closely and precisely related to speech semantically and pragmatically. They refer to concrete events or objects. Iconic gestures also sometimes cooperate with speech to complement the meaning, and give a fuller picture. For example, in 'he shot a man', a speaker accompanies the word shot with a gesture as if he/she is holding a gun with his/her hand. Although he/she does not mention the word gun in his/her speech, it is understood that the shooting was done by a gun and not a rifle through the iconic gesture.

Metaphoric gestures refer to abstract ideas presented in pictorial content. For example, while saying "it was a Sylvester and Tweety cartoon", the speaker performs a gesture with "was Sylves" (adapted from McNeil, 1992). In this gesture, he lifts up his hand

and offers his interlocutor an imaginary object. In this example, the speaker referred to the cartoon genre, which is an abstract concept, as if it was a concrete object.

Beat gestures are movements performed by the hand synchronizing with speech rhythmic pulsation, and are so named due to their similarity with a rhythmic musical beat (ibid). A beat gesture involves two movements performed near the hand's resting position. When a phrase or a word is accompanied by a beat gesture, its significance to the whole narrative discourse is emphasized.

Cohesive gestures are similar to beat gestures in that they mark the significant phrases of the discourse (ibid). However, they differ from beat gestures in that they are used to combine parts of the discourse that are related thematically, but are separated from each other in the discourse.

Deictic gestures comprise pointing (ibid). This kind of gesture is used in narratives and serves to indicate concrete events, objects, places and characters that are present around the speaker. These gestures are also used to point to these things even when they are not present as an abstract concept.

Iconic gestures and deictic gestures are classified as representational gesture (Kita, 2000). This is because the two types involve, to some extent, a transparent relationship between the shape of the gesture and its function, which is why they play a significant role in communication. On the one hand, iconic gesture involves isomorphism to a certain extent between the shape of the gesture and the shape of the entity it refers to. Deictic gesture, on the other hand, is used to point to a space in front of the body as if creating an imaginary object.

The focus of the attention throughout this research project is representational gestures. This is because of either one of two reasons. First, two of the variables that are being investigated in the empirical studies are represented only by representational gestures;

gestural expression of manner and path and dual gestures. Second, for the other two variables; gesture space and gesture rate, the focus will be on representational gestures because they are the most frequently produced kind of gestures. Therefore, they are the ones that are going to be elicited, coded and analyzed.

2.2.1.2 Gesture contribution to speech

Speech-accompanying gesture cooperates with the modality of speech in order to produce meaning. Thus, gesture contributes aspects to the semantic meaning that is being expressed in speech (Holler and Stevens, 2007). They consequently contribute to the message that is being conveyed by the spoken utterance in various ways. Kendon (2004) discusses the contributions which gestures make to accompanying speech and proposes six different ways in which they do so. They are discussed below.

First, gestures synchronizing with speech may convey the exact meaning that is being uttered by the speaker. Although they might be redundant in several cases, the speaker may use these gestures to add a certain meaning or strength to the utterance. For example, as a speaker mentions the word 'money' in her/ his speech, s/he might rub together the tips of their index finger and thumb (De Jorio, 2000). Although the gesture here seems to represent exactly what is being said in speech and could therefore be considered redundant, it may be performed for emphasis, which is therefore considered to be an addition to meaning.

Second, gestures may express a different meaning from the one given verbally, in order to make a significant addition to the meaning that is being conveyed verbally. For example, a speaker may make the same above-mentioned gesture to indicate money as he utters the word 'paid' in 'he paid the rent'. Although the word 'money' is not specifically uttered, a gesture that represents it is performed, thus emphasizing or highlighting the implication of money in the meaning of the sentence (Kendon, 2004).

Third, gestures can be used to specify the meaning of the accompanying utterance. For example, as a speaker says 'reading' in 'She was reading', s/he makes the gesture of flipping the pages of a book. The gesture in this case serves to make what is being read more specific; in this example it is a book (ibid).

Fourth, gestures, moreover, could be used to establish a representation of an item; the gesture illustrates the item. Here, the speaker's hands are used for the purpose of creating perhaps a version of what is being referred to in their speech (ibid). For example, in referring to an apple, a speaker may hold up one of his hands to make a circle, thus representing an apple.

Fifth, gestures can also contribute to the meaning of the verbal component by using them as a means of sketching out the size, shape and other features such as the spatial relationships of the object under discussion or its motion in space. For example, while speaking about "crates as long as that", the speaker performed a gesture in order to demonstrate its shape and size (ibid).

Sixth, Gestures can also function for the purpose of creating various objects in space and in order to refer to them deictically (Kendon, 2004: 176 -177). For example, a speaker may sketch an imaginary circle on the table with his/her index finger to represent a cake. Then, whenever he/she describes any of its features like size, he/she points to the imaginary circle on the table.

Thus, whether gestures express the very thing that is being said verbally or convey a different meaning than that which is being uttered, they almost always contribute in some way to the meaning of the utterance as a whole. Gestures and speech thus operate as two parts of one system to produce the message.

Gesture and speech are strongly connected. An important function of speech is communication. What about the functions of gestures? This question will be discussed next.

2.3 Gesture functions

This section is presented here to show the importance of gesture (the main topic of this research project). It highlights the significant roles gesture plays in communication and cognition. Such functions are some of the points that make gesture worth studying and exploring.

The significance of gestures can be seen through their functions. They have communicative as well as cognitive functions. They are discussed in the following sections in detail.

2.3.1 Gesture communicative functions

Speech-accompanying gesture plays a crucial role in communication. Speakers seem to intentionally use them for making their message even clearer for their listeners. In addition, the gesture modality and speaking modality seem to work together as one integrated system for the goal of conveying a message. This will be discussed here.

Gesture can deliberately be used by speakers for the purpose of communication. The intentionality to use co-speech hand gestures to illustrate speech was investigated in a study by Cohen and Harrison (1973). Each of their twenty four participants performed four tasks that involved giving directions of four areas on a campus of a university to a person who did not seem to know the way. Two of the tasks were performed in a face-to-face situation with that person, and two were performed through an intercom. They found that participants used significantly more hand gestures in the face-to-face set than in the intercom one. The findings from this study suggest that hand illustrators are used intentionally by speakers to make themselves more understandable by the receivers.

Whether gesture is used deliberately or unintentionally, it works side by side with the speech modality to convey information. Sometimes, what is conveyed by the nonverbal modality is not conveyed verbally as the two modalities appear to complement each other.

Communicative roles of gestures were explored in a study by Emmorey and Casey (2002). They asked a group of English speakers to describe where to put some blocks in order to complete a puzzle grid to another group. Half of the speakers were allowed to gesture and half were not permitted to gesture. Also, half the speakers were able to see their addresses and half were not.

They found evidence of how speech and gestures complemented one another. They noticed that the speakers were less likely to verbally express the direction of the rotation if this specific piece of information was gesturally conveyed. This did not seem to be intentional because even speakers who were not seen by their addressees, did not include this piece of information in their speech if it was expressed in gestures (ibid).

Moreover, the speakers used deictic anaphoric construction such as "turn it this way" (ibid) referring to their own gestures when their addresses were visible to them. Thus, gesture appears to have a communicative function. What speakers' gestures convey may not be found in their accompanying speech, which shows that both modalities work together to express a whole message.

2.3.2 Gesture cognitive functions

Beyond communicating information to others along with speech, gestures seem to play a cognitive role while speaking. Gesture accompanying speech seems to reduce the cognitive load on speech, facilitate the access of a speaker to mental lexicon and play a crucial role in the conceptual process of planning for speaking. These cognitive functions of gesture will be discussed further here.

Gesture appears to reduce the cognitive burden on speakers. The cognitive function of gesture was explored in a study where they had adults as well as children recall particular letters and words while explaining the way they solved a given math problem (Golin-Meadow, Nusbaum, D. Kelly and Wagner, 2001). They manipulated the speakers' gesturing

39

conditions; once they were permitted to gesture, and another they were not permitted to gesture. Then, the effect of such manipulation was observed on the cognitive activity. They found that the two groups recalled significantly more letters or words when they used gestures along with their explanation than when they did not produce gestures. This was because gesture seems to lighten the cognitive load required for the explanation task, and therefore, more cognitive capacity would be available to perform the memory task.

Gesture-accompanying speech can also facilitate a speaker's access to the mental lexical items. This was examined in a study where participants were asked to describe action animated cartoons to a receiver (Rauscher, Krauss, and Chen, 1996). They also manipulated speakers' gestures; once allowing them to gesture, and another preventing them from gesturing. They found that when speakers where allowed to gesture, they produced more gestures with utterances that indicated spatial content than with those that indicated other kinds of content. They also found that when participants were allowed to gesture, speech that represented spatial content was more fluent than when they were prevented from gesturing. In contrast, speech that did not have any spatial content did not appear to be affected by the prevention or allowing of gesturing. It seems that preventing speakers from gesturing made it more difficult to access certain lexical items; in this case, items with spatial content. The findings from this study suggest that mental the lexicon (the lexis stored in the brain) can be accessed more easily by speakers through their use of gesture.

Gesture seems to play a role in the conceptual planning for speech production. Alibali, Kita and Young (2000) have come to this conclusion in their study. They asked 5-year-old children to perform two tasks where lexical access should be comparable, with distinct packaging of information; an explanation task and a description task. In the explanation task, in a Piagetian conversation (where children determine whether a certain quantity remains the same after undergoing a physical transformation), children explained the

reason why the quantity of two items was the same or different. In the other task, which was descriptive, children described the way two things looked distinct. Children's verbal responses were comparable indicating comparable lexical access regarding spatial words. This means that the children's spatial responses were similar across the two tasks. However, when the accessibility into the spatial words in the two tasks was compared, it was found that the demands for the packaging of information were different. Children's gestures across the two tasks also differed. The children produced more substantive gestures and more non-redundant gestures in the explanation task than the description task. In other words, they found that during the explanation task, children made more gestures that expressed perceptual aspects of the objects as well as more gestures that communicated information that was different than that of its accompanying speech. The children used more gestures in the explanation task because it was more difficult than the description task. The conceptualization was more complex in the explanation task. The children seemed to have used gestures to facilitate thinking and memory accessibility. This study proposes that gesture influences the speech conceptual planning.

To sum up, beside the purpose of communication, gestures also seem to have cognitive functions when they are produced along with speech. They can decrease the cognitive load on speakers and so the accordingly freed capacity can be used to perform another task, aid accessing the mental lexicon and are involved in the conceptual planning for speaking.

2.4 Factors influencing gesture

Since one of the goals of this research project is to explore gesture features of Arabic speakers in comparison to English speakers, and to discuss the factors that might have shaped those gestures, it has become necessary to present the literature related to this area. Therefore, this section presents one of the main subjects of this research project. It demonstrates the

factors that might have played a role in shaping gestures with certain features as suggested by many previous studies.

We inevitably produce gestures as we speak. Such gestures seem to acquire certain characteristics that make them cultural or language specific as in the 'thumb up' gesture in Europe (meaning good). Despite the claim that gestures are universal in terms of their meanings, a number of studies have provided evidence that there are geographical gestural differences among people from different cultural backgrounds (Efron, 1972, Kendon, 2004, Kita, Danziger, & Stolz, 2001, Kita, and Essegbey, 2001; Kita, and Özyürek, 2003). In observing such cross-cultural variations concerning gestures, and according to several previous studies, there appear to be certain causes for them. There seems to be certain factors that might have shaped gestures with certain features that differ cross-culturally. These factors might be the ecological effect (environmental effect), the semantic and grammatical spoken language structure, thought formation (constructing thought) and social norms. These aspects will be discussed further and illustrated by various example studies in the following section.

2.4.1 Thought formation

Gesture may be shaped by how thought is constructed by individuals of a particular culture. For example, constructing abstract concepts in space seems to be cultural-specific. This will be discussed in this section through a study that investigated how speakers from two different Mayan cultures; the Mopan and the Yucatec refer to the right and left relations and represent abstract concepts in space (Kita, Danziger, & Stolz, 2001).

Structuring spatial information was compared in the Yucatec and the Mopan cultures in a study by Kita, Danziger, & Stolz, (2001). These cultures have a lot of cultural characteristics in common. This is because both groups are descended from the same

ancestors. Their languages are intrinsically related, their occupation is slash-and-burn farming, and they live in small groups.

However, Kita, Danziger & Stolz (2008) found significant differences between the two communities. They found that these two cultures differ regarding the way they think about space. Their findings relate to the lateral axis, which is the left-right axis. For the Mopans, this lateral axis is not contrastive. In other words, relations that have to do with right and left do not play any role in the conceptual conduct of space. On the contrary, the Yucatecs conceptualize this lateral axis as being contrasting. So, they do refer to left and right in their conceptual space structuring. For example, the Yucatecs gave the right description for mirror images (such as an image with a tree on the left and a man on the right, and another with a man on the left and a tree on the right), whereas the Mopans gave identical descriptions of the two images. Such difference was reflected in their languages.

Such conceptual difference was also found in their gestural representations of space. Through a story-telling task, they found that the Mopan speakers' location and motion gestures were predominantly non-lateral. In contrast, the same kind of gestures produced by Yucatec speakers was lateral. It was also found that Mopans did not employ gestures for to-the-right-of and to-the-left-of relations in representing spatial conceptualization while Yucatecs did.

Such gestural representation difference between those two Mayan cultures also included abstract concepts like the flow of time. The Yucatec Mayans assigned a sequence of incidents along the lateral axis, and the Mopan Mayans did the same only along the sagittal axis. Hence, some cross-cultural variation in speech-accompanying gestures may be caused by some culture-specific way of representing certain concepts such as time flow.

2.4.2 Effect of social norms on gestures:

Gestures accompanying speech may vary across cultures, perhaps because of certain features that result from particular social values and norms in a certain community which are considered culture-specific. These values may control the production of gestures and, accordingly, shape their manner. This will be discussed here through a study that investigates the use of left hand for pointing in Ghana where the use of left hand is considered a taboo.

This can be seen in a study by Kita, and Essegbey, (2001) in which using the left hand for pointing in Ghana was investigated. Using the left hand in Ghana is considered by many people there to be a taboo. The effect of this taboo on the gestural practice of members of the Ghanaian society was examined by observing gestures that are produced in naturalistic situations where participants were asked to give route directions.

They found that there seemed to be a convention of politeness where Ghanaian speakers tended to put their left hands on their lower backs, which looked like they were hiding them from their interlocutors. They also found that as a result of the suppression of the left hand, they used the right hand to point to things located to the left across the body. Sometimes, pointing was accomplished by both hands, which did not seem to break the rule of the taboo. Thus, social values seem to contribute in shaping gesture production in a given community. This leads to a cross-cultural variation in gestures.

2.4.3 Diversity in conceptualizing space

Gestures accompanying speech often express space (McNeill, 1992; Rauscher, Krauss, & Chen, 1996). Cultures differ in conceptualizing spatial information (Majid, Bowerman, Kita, Haun, Levinson, 2003; Levinson, 2003; Levinson, Kita, Haun, & Rasch, 2002; Kita, 2009). As a result, speech-accompanying gesture can be influenced by how abstract concepts such as space are conceived and processed.

The difference in conceptualizing space across cultures can also be seen in how speakers from different cultural backgrounds represent relative location and direction on the horizontal plane. Using the relative frame of reference or the absolute frame of reference are two ways through which location and direction can be represented.

The relative frame of reference is used to specify location and direction by relations between objects (Levinson, 2003). A speaker can represent location and direction in relation to the orientation of his/her body (Kita, 2009). In 'the pen is to the right of the book', *right* is determined by the horizontal left-right axis in front of the speaker's body. This can change relatively if the direction the viewer is looking at changes (Levinson, 2003; Kita, 2009).

The absolute frame of reference is more fixed. It does not change according to the orientation of the body of the speaker. In describing the previous location of the pen in the above example, a person can say 'the pen is to the west of the book' (Levinson, 2003; Kita, 2009).

Several cultures, on the one hand, mostly depend on the relative frame of reference to indicate location and direction in language, spatial thinking and gestures. They are "relative-thinkers" (Levinson, 2003: 112). For example, speakers of English, Dutch and other European languages use relative frame of reference. They describe location and direction with the words *left* and *right* (Pederson et al., 1996; Levinson, 2003). If they ever use a word that refers to cardinal direction such as 'north' or 'south' to indicate extensive spatial relations, it might still be based on a relative frame of reference conceptualization process (Levinson, et al., 2002; Kita, 2009).

In a non-linguistic memory task, speakers from these cultural backgrounds were shown three toys of animals, which were arranged in a particular sequence. From left to right, there were a cow and a sheep, and the horse was the last one. At the same time, this sequence was arranged from north to south. After that, they turned around, and they were asked to

rearrange the sequence of the animals as they remembered it in another place. In recalling the sequence, they used the relative frame of reference. They kept the old sequence of the animals from left to right (Levinson, 2003; but see also the debate between Li & Gleitman, 2002 and Levinson et al., 2002; Kita, 2009).

On the other hand, some cultures use the absolute frame of reference for the purpose of indicating location and direction. They conceptualize spatial information with "absolute minds" (Levinson, 2003). An example of such cultures is speakers of an Australian language called Guugu Yimithirr (Haviland, 1993). In their language, they do not have vocabulary that refers to relative frame of reference. Instead, they only use absolute frame of reference terms such as north, south, east and west. As a result, in order to describe the location of the pen in the above-mentioned example, they would use absolute frame of reference terminology. They would say 'the pen is to the west of the book'. In recalling the sequence of the animals in the previously mentioned non-linguistic task, they used absolute frame of reference (Levinson, 2003, Majit et al., 2004; Kita, 2009).

This cross-cultural difference in using frame of reference is also represented in speech-accompanying gestures. Speakers from a cultural background that depends on a relative frame of reference in indicating location and direction use this kind of reference in their gestures. For example, American English speakers express the direction of a movement using the relative frame of reference. In describing the movement of an object towards the right, an American English speaker performed a gesture towards the right (Kita, & Özyürek, 2003; Kita, 2009).

The dependence of a culture on the absolute frame of reference in indicating location and direction is also represented in gestures accompanying speech. For example, speakers of Guugu Yimithirr describe the movement of an object using the absolute frame of reference (Haviland, 1993; Levinson, 2003). A speaker of this language was speaking about his

experience twice. In the first one, he was looking towards the west, and in the other one, he was looking towards the north. In both situations, it was found that all of his gestures indicating movement or direction were performed in regard to the absolute frame of reference (Haviland, 1993; Kita, 2009). For example, in describing a movement from north to south, if he was facing south, his gesture expressed a movement towards the south and away from the body. It is interesting that such gestural representation of the absolute frame of reference was observed even if it was not mentioned in speech.

Where did this spatial concept originate? Majid et al. (2004) explained this phenomenon to be an effect of language. They say that because they use absolute frame of reference in their language, it has been established as a habitual though. This means that the way they think about directions has become a habit in their minds. As a result, even if speakers of Guugu Yimithirr do not use the cardinal direction terms in their speech, they are represented in their gesture.

2.4.4 Effect of language on speech-accompanying gestures

The semantic and grammatical structures of a language may also cause a cross-cultural variation in terms of gestures accompanying speech. Gestures seem to follow the grammar of a given language to some extent and so differ cross-linguistically.

The effect of the semantics of three languages; English, Japanese and Turkish on the gestures was investigated in a study by Kita & Özyürek (2003). The movement and arc-trajectory that the word 'swing' indicates is found in English in one word while in Japanese and in Turkish, there is no such word that expresses that. In describing a video clip of a cartoon where Slyvester, a cat, swung between two buildings by a robe, it was found that almost all the English speakers used the word 'swing' in their verbal description. In contrast,

47

almost all Japanese and Turkish speakers expressed the event of swinging in speech but no one expressed the shape of arc-trajectory.

This linguistic difference was reflected in their gestures. English speakers expressed the arc trajectory as well as the change of location in their gestures as a reflection of having the word 'swing' in their language. In contrast, most of the Japanese and Turkish speakers conveyed the change of location in their gestures. They did not produce gestures that refer to the arc trajectory. These results show the linguistic influence on gestural representation.

Gesture features can also be influenced by certain grammatical structures in a language. Expression of manner and path differs syntactically across languages (Talmy, 1985). Accordingly, languages have been classified into Satellite-framed languages and Verb-framed languages (Talmy, 1991). Satellite-framed languages (such as English) are more likely to conflate manner with motion in the main verb as in 'roll' in (1), and the path is conveyed in a particle called satellite as in 'down' in (1). Whereas verb-framed languages such as Turkish and Japanese are more likely to conflate path with motion in the main verb, and manner, if mentioned, is expressed in an adverbial or in a separate verb. Manner and path can be expressed in speech in either a single clause or in two clauses according to the language typology. Satellite-framed languages speakers typically express manner and path in speech in a single clause as in example (1) below. Verb-framed languages, on the other hand, typically express manner and path in two separate clauses (Allen et al., 2007).

Example (1)

The Tomato rolls down the hill.

However, it might be necessary here to highlight the restrictiveness of the binary verb-framed and satellite-framed language distinction. Languages may also use other means to express motion not typically used by their framing type (Beavers et al., 2010; Croft et al., 2010). For example, Italian is known to be a verb-framed language (Talmy 1991). This is

because it predominantly uses verb-framed languages' methods in expressing motion. In Italian, path is conveyed in the main verb, and manner, if mentioned at all, is conveyed in a separate component such as an adverbial (ibid). This is typically done by verb-framed languages users, as mentioned above. However, path in Italian may be expressed by ways typically used by satellite-framed languages (Wessel-Tolvig, Bjørn, and Patrizia Paggio, 2017). For example, in (2), manner is expressed in the main verb, and path is expressed in its satellite.

Example (2)

"Il pallone [FIGURE] rotola [MANNER] *giu`* [PATH] per la collina [GROUND]

'The ball rolls *down* the hill'" (ibid)

This feature of Italian might have made it less verb-framed than other verb-framed languages that do not have this feature. If there is a language typology continuum with verb-framed languages placed on one end of the continuum and satellite-framed languages on the other end of that continuum, verb-framed languages would be distributed between the verb-framed languages end and the middle of the continuum, languages that use both styles equally are located in the middle point of the continuum, and satellite-framed languages are distributed between the middle point of the continuum and the satellite-framed languages end of the continuum. On this continuum, Italian would be placed closer to the verb-framed languages end but just before the middle point of the continuum.

This syntactic packaging of manner and path is reflected in gestures. Speakers of satellite-framed language are more likely to conflate manner and path in gesture, whereas speakers of verb-framed languages tend to separate the two elements in gesture (Kita & Özyürek, 2003; Gullberg et al., 2008; Özçalışkan et al., 2016a). Gestural expression of manner and path in two typologically different languages (English and Turkish) was investigated in a study by Özyürek and Kita (1999). Speakers described motion events in

animated cartoon. It was found that English speakers included manner and path in one clause with a manner verb accompanied by a path particle to express a motion event. In contrast, Turkish speakers expressed manner and path in two separate clauses. In gesture, English speakers were more likely to conflate manner and path into a single gesture, whereas Turkish speakers expressed the two spatial elements in separate gestures.

To the best of my knowledge, gestural expression of manner and path in Arabic has not yet been explored. Based on the above-mentioned study Özyürek, and Kita (1999), Arabic gesture is predicted to have similar pattern of the Arabic speech typology in expressing manner and path.

How are manner and path syntactically expressed in Arabic? It seems that this is an area of controversy. On the one hand, Talmy (2007) classified Arabic as a verb-framed language. Almurshidi (2013) also claimed that Arabic is a verb-framed language. In her study, she compared how motion events are encoded in Arabic and English in speech. This was done through eliciting descriptions of Chafe's (1980) Pear Story. She used a discourse analysis approach. She applied Talmy's (1985, 2007) typology on the Arabic and English descriptions of motion events in her data. She concluded that because the typology is applicable on her data, Arabic is a verb framed-language. However, her study does not provide quantitative evidence for her claim that Arabic is actually a verb-framed language. Furthermore, the stimuli used in her study were not designed for the purpose of eliciting manner and path.

On the other hand, it has been suggested that Arabic is not a verb-framed language, and it does not fit nicely into Talmy's (1985) typology. It has been claimed that Tunisian Arabic should not be classified as a verb-framed language because Tunisian Arabic applies other strategies in expressing motion events than only conveying path in a verb and the

motion in another separate clause such as using two verbs to express manner and path within a single clause (Saidi, 2007).

Nonetheless, all of the strategies Saidi (2007) mentioned in paper are also used in other dialects of Arabic such as Saudi Arabic. Saidi (2007) has given examples of structures that suggest that Arabic might not be a verb-framed language such as the use of a manner verb followed by a directional path prepositional phrase. Moreover, Saidi's (2007) is only a discussion of the Talmy's typology and Arabic. It does not provide quantitative evidence of the actual typology used by the Arabic speakers. Both studies Almurshidi's (2013) and Saidi's (2007) are discussed further in detail in Chapter Three in section 3.1.1.1 in relevance to the current study.

The current study fills in this gab in the literature of language typology. It provides quantitative as well as qualitative evidence on how the Arabic speakers express motion events in speech and gesture.

Thus, one of the factors that can shape gesture is language. For example, the typology used in a language for expressing motion events can affect the ways its speakers gesture.

2.4.5 The effect of ecology on gestures

Gesture use can differ cross-culturally due to environmental factors. For example, speakers live in a very noisy environment, and are used to it, their gestures may be affected by their surroundings. The need to be heard in such a noisy place may make them produce bigger gestures. In contrast, in a considerably quiet environment, speakers may produce smaller gestures. This kind of effect is referred to as 'ecology' by Kendon (2004).

Gestures employed by speakers with different cultural backgrounds were compared in a study by Efron (1972). In his study, he compared Jewish (originally Lithuanian and Polish) and Southern Italian immigrants in New York City who still use their own languages. He also collected data from assimilated affiliates of the above-mentioned groups. Members of the

assimilated groups are of the same origin as the immigrant groups but they have broken away from the traditional practices of their original groups, and their general behavior are identified as being American. The comparison between the immigrant and assimilated groups highlighted what changes had taken place after being exposed to the American culture (Efron 1972) and (Kendon (2004).

He found significant differences between the conventional Italians and the conventional Jews. He found fewer differences between the two assimilated groups as well as similar use of gestures to that of Anglo-Saxon communities. This might be evidence that the differences in gesture use between the traditional Italians and the traditional Jews are caused by cultural factors and not biological or racial ones. Efron (1942, 1972) believed that the differences were due to cultural reasons. He explained that their gesture features seemed to be influenced by the ecological factors they experienced when they used to live in Europe.

It is not clear if these differences were caused by language because of the following reasons. Firstly, Efron's (1942, 1972) recordings were silent (the language used was not recorded). Secondly, if these differences were caused by language, the mechanism through which language might have affected their gestures is unclear here. Thirdly, even if language was a factor in causing the differences in gesture, this does not negate the possible influence of the cultural factor.

One of his findings with respect to differences between the conventional groups was the use of larger gesture space by Italian speakers compared to Jewish speakers. In addition, while speaking Italian speakers produce a high gesture rate (Barzini, 1964; Kendon, 1992, 1995). In contrast, British English speakers are recorded to produce low gesture rate (Graham and Argyle, 1975).

It is suggested that ecology is one of the factors that might have played a role in shaping Southern Italians' gestures with these features (Kendon, 2004). Kendon (2004) and

52

De Jario and Kendon (2000) proposed this idea by providing Neapolitans' gestures and their surrounding ecological features as an example. They suggested that one of the factors that shape the Neapolitans' gestures is being surrounded by certain ecological features. For example, because the streets of Naples are too busy and noisy, the speakers feel the need to make bigger gestures in order to be heard. This is discussed further in detail in Chapter Three in section 3.1.3.

To the best of my knowledge, the speech-accompanying gestures employed by Arabic speakers have not been investigated regarding their frequency and size. Based on Kendon's (2004) argument of the effect of ecology on gesture, if speakers come from different cultural backgrounds that have similar ecological features in common, would these speakers have similar gestural properties?

2.4.6 The effect of L2 on L1 gestures

One of the factors that might have an influence on shaping L1 gesture is knowledge of an L2. Brown and Gullberg (2010) looked into the effect of L2 on L1 by comparing path expressions in Japanese monolinguals, English monolinguals and Japanese intermediate learners of English. Their results regarding this point were as follows. First, they found that English monolinguals used adverbials to express path, which is typically done by satellite-framed languages. When English monolinguals stacked path adverbials within a single clause to express path, their adverbials could describe all the elements of the trajectory including the source (beginning point), the goal (ending point) and the movement. They could say "down the street into a bowling alley" (ibid). In this example, each adverbial explains a different element of the journey.

In regard to Japanese monolinguals, it was found that they primarily used verbs to express path, which is typically done by verb-framed languages. If they used adverbials to express path, they only used them to encode the goal and the source of the trajectory. So,

when they stacked adverbials within a single clause, they only encoded the beginning and the ending points of the journey as in "chiyou-kara Tweety-no tokoro-made 'from the ground to Tweety's place'" (ibid).

In Japanese speakers with intermediate knowledge of English, it was found that in their L1 speech, they used frequently used both strategies; verbs like monolingual Japanese speakers and adverbials like monolingual English speakers (ibid). Moreover, it was found that these speakers produced more specified path expressions to describe complex trajectories and not just the beginning and the end points of the motion. They produced more path expressions within a clause than any of the monolingual groups. This shows an influence of L2 knowledge on L1.

The effect of L2 on L1 can be observed in manner expressions. Brown and Gullberg (2008) compared manner expressions produced by monolingual Japanese and English speakers and Japanese intermediate learners of English. Manner expressions were elicited through narratives. It was found that the Japanese learners of English displayed manner modulation in their descriptions while speaking their L1. Manner modulation means mentioning the manner is speech and not in gesture (McNeill, 2001, 2005). English speakers usually use manner modulation, whereas Japanese speakers do not. Thus, the Japanese learners of English were using more English-like patterns in expressing manner in speech and not in gesture while speaking their L1.

The effect of L2 on L1 can also be spotted through gesture viewpoint. Gesture viewpoint represents "the perspective from which a gesture is deployed" (McNeill 1995, 2005). According to McNeill (1995, 2005) gesture viewpoint could either be from the perspective of the character or that of the observer. The character viewpoint is when the event is encoded in first person as experienced by the character. The observer viewpoint is when the event is encoded in third person as witnessed by the speaker.

The effect of L2 on L1 was investigated through examining gesture viewpoint in a study by Brown (2008). In her study, gesture viewpoint was studied in monolingual Japanese speakers, monolingual English speakers and Japanese intermediate learners of English during descriptions of motion events. It was found that monolingual Japanese speakers performed more character viewpoint gestures than monolingual English speakers, who performed more observer viewpoint gestures. It was also found that Japanese intermediate learners of English displayed more monolingual English patterns than monolingual Japanese patterns regarding gesture viewpoint. This shows an influence of L2 on L1 gesture.

The influence of L2 on L1 gesture can also be observed through gesture frequency. Gesture frequency was compared in Chinese monolingual speakers, American English monolingual speakers and Chinese learners of English in a study by Wing Chee So (2010). Gesture and speech of these speakers were elicited though narrations. Then, they calculated the number of gestures per clause. They found that American English is a high gesture frequency language when compared to Chinese. While speaking Mandarin-Chinese, they found that bilingual speakers produced a higher number of representational gestures per clause than Chinese monolingual speakers, but the rate of these gestures was similar to that of English monolingual speakers. This increased number of representational gestures in the bilingual speakers while speaking their L1 Chinese is an influence of their L2 English.

2.5 Gestures and second language

Since one of the main goals of this research project is to explore gesture features of L2 learners, perhaps it is necessary here to demonstrate the crucial role gesture plays in communication and cognition in L2 discourse in light of the related literature. In L2 learners, it seems that role even becomes more significant. This is discussed in the following sections.

2.5.1 gesture functions in second language learners

Second language learners' gestures serve communicative functions. They also shed light on the cognitive processes that occur within the mind of a second language learner. In the following sections, I will discuss the communicative functions and cognitive processes of gestures in relation to second language learners.

2.5.1.1 Gesture communicative functions in second language learners

Second language learners use gestures along with speech to communicate better in L2. Their gestures play various communicative functions. They can be used as a compensatory strategy to complement L2 speech. They can also be used as an embodied completion (replacing words with gestures to complete the speech) in order to accomplish successful interface with their conversational partners. Moreover, anaphoric gestures are used to achieve a more coherent L2 discourse. These functions will be discussed further in the following sections in relation to literature.

2.5.1.1.1. A COMPENSATORY STRATEGY

Speech and gesture integrate to form a unified system (McNeill, 1992). In this system, gesture can contribute meaning to speech that is not verbally conveyed (Kendon, 2004), as previously discussed in sections 2.2.1 and 2.2.1.1. This means that gesture can compensate for speech by expressing an additional meaning to the one conveyed by speech alone. This dimension of the compensatory function of gesture is used to complement speech. In other words, gestures, especially representational ones, which provide information on the referents such as shape, size or manner are recognized "as a compensatory tool to bridge the gap between communicative intentions and available expressive means" (Gullberg, 2013). Another dimension of this compensatory function of gesture is employed when speech fails to convey the message. In this case, compensatory gestures are produced to substitute words

56

when the speaking channel collapses (Gullberg, 1998: 64). These can be observed in the field of aphasia and language acquisition (Gullberg, 1998).

Previous research has shown such compensatory use of gesture. Gestures can be employed to solve linguistic shortcomings. When L2 learners go through expressive problems recognized by repetitions, hesitations, slow articulation or overt appeal for assistance, they use gestures to solve them (Gullberg, 1998, 2011b, 2013). Gullberg (1998, 2011b) provided an example on this case. A Dutch L2 learner of French tried to solve a lexical problem with a gesture. In an attempt to convey *peindre* meaning *paint,* she said *couloir son maison* meaning *color his house*. As she said that, she produced a representational painting gesture as a solution to compensate for the lack of the appropriate lexis.

This compensation function of gesture was also explored in Kita and Goldin-Meadow's (2013) study. They examined the relation between concrete deictic gestures (i.e; gesture referring to physical objects) and speech, and if this was influenced by L2 learners' language frequency. Two groups of English learners with different proficiency levels retold a story in English. They found that the proficient L2 learners produced concrete deictic gestures for entities referred to and specified in their speech.

Pervious empirical studies on using gesture for compensation in L2 have revealed that the gesture rate grows higher with more encoding problems. For example, in a study by Marcos (1979), it was found that English-Spanish and Spanish-English bilinguals produced a higher rate of gesture of all types in their L2. Additionally, in other studies, it was found that English learners of Japanese and Japanese learners of English produced higher gesture rate in their L2 (Jungheim, 1995a; Kita, 1993; Nobe, 1993).

This was also investigated in a study that has been conducted by Gullberg (1998). She explored the communication strategies of L2 learners through examining the strategic use of

gestures by a group of French students learning Swedish and a group of Swedish students learning French. They retold a story of a cartoon clip once in their first language and another in their L2 to native speakers in conversational narratives. It was found that gesture rate generally increased while speaking L2 as an inverse effect of language proficiency; the lower language proficiency the more strategic gestures used. Besides the rate of those strategic gestures used, learners seemed to use them to elicit words from their conversational partners, to overcome problems of co-reference and to metalinguistically indicate that there was a problem such as disfluency or lexical search (Gullberg, 1998). She also found that these gestures helped keep the floor when disruption was caused by fluency (Gullberg, 2008). These findings show that gestures can be used by second language learners for the purpose of complementing speech in order to accomplish communication.

To sum up, gesture can compensate for speech. Particularly, L2 learners use gestures sometimes to solve lexical problems. Therefore, gesture plays a crucial communicative function when they fail to express meaning in speech

However, in opposition to this notion, other previous studies have shown that gesture do not compensate for speech. In these studies, gestures are redundant with speech. In this regards, in the above-mentioned Kita and Goldin-Meadow's (2013) study, in which they examined this relationship between speech and gesture, they found that the proficient L2 English learners produced iconic gestures for entities that were referred to and specified in their speech.

Previous research on gestures accompanying placement verb also showed that gestures are redundant with speech. For example, in a study by (Gullberg, 2011a), it was observed that native Dutch speakers, who use the verb *zetten* meaning *set* or the verb *leggen* meaning *lay* according to the properties of the entities being places, performed gestures with hand shapes representing the entity with the path, expressing the meaning of the verb. In

contrast, native English speakers usually produce path gestures while saying *put* expressing the meaning of the verb (i.e; cause to change location) (Gullberg, 2009). Thus, native English speakers do not gesture about the entity if it is not expressed in the verb. A similar pattern can also be seen in English learners of Dutch. They used only one of the placement Dutch verbs mentioned above, a verb to do, or intransitive constructions (Gullberg, 2009). They accompanied the verb with path gestures that did not incorporate the entity being placed. This means that they gesture in an L1 English way. Thus, their gestures here do not compensate for their speech.

Despite the claim that gesture rate increases in L2 as a result of the compensatory use of gesture, previous literature has shown no difference between learners from different L2 levels. For example, Chen (1990) did not find any difference between gesture rate in Chinese learners of English with high proficiency level and those with low proficiency level. Also, Valokorpi (1981) found no difference between gesture rate in L1 and L2 of Finns learners English.

In regards to manner and path expressions, previous work has shown that gestures do not compensate for missing information in speech. For example, in Stam's (2006) study, L2 learners speech and gesture co-expressed path.

In summary, there are two notions regarding gesture compensation for speech. One line of literature supports the notion that gesture can compensate for speech. In this notion, studies have shown that gesture can function as a compensatory tool used by L2 learners to overcome linguistic shortcomings. In opposition to this notion, there are studies that claim that gesture do not compensate for speech, and are only redundant with it. Which of the above-mentioned notions do results of the current study are with?

2.5.1.1.2 EMBODIED COMPLETION:

Embodied completion is the use of gestures to complete a spoken utterance (Olsher, 2004). When second language learners are speaking L2 to native speakers, they tend to use gestures to elicit words from them to replace missing words. This was one of the results found in Gullberg (1998)'s previously mentioned study in section 2.5.1.1.1.

Additionally, this was looked at in a study by Mori and Hayashi (2006). They investigated informal interactions between native speakers and second language learners of Japanese focusing on the coordination between the verbal and non-verbal behavior resources that were being employed to achieve intersubjectivity. Intersubjectivity is defined as "the linguistic expression of a speaker/ writer's attention to the hearer/reader" (Traugott, 2010). Mori and Hayashi's (2006) study, precisely, examined the embodied completion. When this was done by an L2 speaker while conversing with an L1 speaker, the L1 speaker tended to provide a more sophisticated linguistic term to reformulate what the L2 speaker just said. Such an embodied completion was preceded by processes used in order to evaluate and discover as well as establish common ground of speech and gesture to accomplish intersubjectivity between participants (Mori and Hayashi 2006).

2.5.1.1.3 COHESION STRATEGY:

One of the problems that second language learners face while speaking L2 is to produce a cohesive discourse. Second language learners use gestures strategically along with speech to produce a more coherent communication. They place events, objects or people in their speech through gestures in the space around them, and refer back to them over and over again whenever they mention them (anaphoric reference) using deictic gestures (Gullberg, 1998, 2003, 2006b; McCafferty, 2004). For example, a speaker can point to certain space

around him/her to establish a point for certain referent. Then whenever that referent is mentioned, the speaker points to that point in space.

This was investigated in a study carried out by Gullberg (2006). This study looked at the communicative account of overexplicit second language discourse through concentrating on the interrelationship between the spoken and gestural cohesion. Overexplicit here is "when learners consistently overuse lexical nominal expressions in an immediately maintained context and use very few pronouns and zero anaphora" (Gullberg, 2006). This gestural cohesion was accomplished through referents anchoring in gestures space. The study, specifically, explored the use of interactional communicative strategies through the interconnection of overexplicit reference in speech and anaphoric use of gestures. In order to find out, L2 speech and gestures of sixteen Dutch students learning French were examined while retelling stories to listeners in two different visibility conditions. It was found that anaphoric gestures were present whether they could see their interlocutors or not. The space where these gestures are performed differed as the visibility condition differed.

To sum up, gestures are employed to serve certain communicative functions by second language learners such as complementing speech, accomplishing subjectivity while conversing and producing a more coherent discourse.

2.5.1.2 gesture cognitive functions in second language learners

When speech-accompanying gestures are used by second language learners, they may reflect the cognitive processes that take place within the L2 speaker's mind. Such an insight may be clearer when second language learners use gestures accompanying speech as a tool of self-regulation and when the use of gesture accompanying speech by second language learners indicates a progress towards acquiring L2. These points will be discussed in more detail in the following sections in the light of literature.

2.5.1.2.1 SELF-REGULATION:

Second language learners use gestures in order to achieve self-regulation. Using gestures for self-regulation is to use them to get internalization and control while speaking L2 (Platt, and Brooks, 2008). They argue that gestures produced by second language learners during performing a task serve to fulfill crucial regulatory functions for the overall accomplishment of the task they are performing. Such functions reveal development in L2. In order to show that, they conducted an experiment where two pairs of Swahili learners were asked to perform some problem-solving tasks. The participants successfully managed to use a range of the cognitive and linguistic as well as bodily resources to complete the task. They employed gestures, gazes and other body motions as well as physical contact with the materials of the task to help them accomplish self-regulation, which allowed them to perform the task with the least effort.

Moreover, an L2 speaker's use of anaphoric gestures helps organize thoughts and convey them in L2. Using anaphoric gesture for the purpose of placing characters in certain points in space, mentioned earlier in Gullberg (2006)'s study, seems to also have an interpersonal dimension. This is also consistent with what McCafferty (2004) observed how one of the speakers in his study mapped his discourse out according to certain points that has created in space in order to make it easier for him in organizing his thoughts as well as expressing these thoughts in L2. Thus, the cognitive function of gesture is apparent in this speaker's use of gesture. (See section 2.2.1.1 for examples).

2.5.1.2.2 A SIGN OF LANGUAGE DEVELOPMENT:

It has been observed that gesture-speech mismatches reflect development in the learning process (Goldin-Meadow, 2005). Precisely, gesture-accompanying speech can shed light on the progress of second language learning process. For example, the higher the rate of gestures used while speaking L2, the lower the proficiency is in that language. This has been

found also in the above-mentioned study of Gullberg (1998). She found that proficiency level had an influence on the number of gestures produced by second language learners.

Thinking for speaking has also been used by some researchers to show that, beside speech, gesture can be used to observe progress in L2 (Stam, 1998, 2006a, 2006b). Thinking for speaking indicates thinking that takes place on-line during the speaking process (Slobin 1991). Stam (1998, 2006a, 2006b) argues that gesture and not speech alone can be used as an indicator of L2 proficiency. She showed that through investigating thinking for speaking of Spanish speakers who were learning English. As we saw above, according to (Talmy 1985, 1991, 2001) Spanish is one of the verb-framed languages in which path and motion are expressed through the verb, and if speech also conveys manner, it is not expressed by the verb but by an adjunct, whereas English is one of the satellite-framed languages in which manner and is expressed by the verb, and path is conveyed by a satellite such as an adverb or a particle. (See section 2.4.4).

The ways native speakers of English and Spanish and intermediate and advanced Spanish learners of English express path linguistically as well as gesturally were investigated in a series of studies by Stam (1998, 2006a, 2006b). It was found that intermediate Spanish learners of English were more target-like regarding their gesture production when only the rate of path gestures were considered. But when looking at what expressions and what features of motion events were emphasized by speech and gesture together, it was found that second language learners had gestural and linguistic features of both L1 and L2 thinking-for-speaking patterns. However, the speech and gestures of the advanced learners were closer to those of native speakers (Stam, and McCafferty, 2008).

To sum up, speech-accompanying gestures seem to serve some cognitive functions when used by second language learners. These gestures could play a self-regulatory function

in L2 speakers' discourse. They can also be used as sign of progress towards second language learners' mastering of L2.

2.5.2 Factors influencing L2 gesture

One of the main points this research project explores is L2 gesture features of Arabic early leaners of English. It also looks into some of the factors that might have caused them. Therefore, this section highlights the factors that might have played a role in shaping L2 gesture with certain features in the light of pervious literature.

Gestures produced by speakers while speaking their first language may differ than the ones produced during their second language speech. These differences may result from several factors such as language proficiency and target language exposure. These factors are discussed in the following section through example studies from the literature.

2.5.2.1 SECOND LANGUAGE PROFICIENCY

Gesture of second language learners is influenced by their proficiency in the second language. Low proficiency in language may influence speakers' gesture use. The influence of second language proficiency on speech-accompanying gestures was examined in Moroccan speakers learning French in a study by Tranager and Coupier (1984). They found that as the learners' proficiency grew, they switched from using representational gestures for the purpose of complementing speech into using rhythmic gestures associated to the discourse of the speech (Tranager, and Coupier, 1984) in (Gullberg, 2006).

L2 learners may use gestures to overcome difficulties they encounter because of their limited lexical and grammatical resources. The effect of grammatical difficulties on gesture use was investigated in a study of second language learners by Gullberg (1999). It was found that second language learners tended to overcome grammatical obstacles by using gestures. In grammatical problems related to tense, they used gestures to refer to a certain time axes in

order to establish time accurately. To do that, they metaphorically mapped the time they wanted to express onto space. They did that even if their speech did not indicate any indication of temporality (Gullberg, 1999) in (Gullberg, 2006).

Such difficulties may result in increased gesture rate. According to Goldin-Meadow et al. (2001), gesture increases the cognitive capacity for performing. Therefore, it is assumed that as the task becomes harder, gesture rate becomes higher (Gullberg 2006). Perhaps due to difficulties in second language production, second language learners produce more gestures while speaking their second language more than while they are speaking their first language. This was found in Gullberg (1998)'s study mentioned earlier in section 2.5.1.1.1.

If a language has a considerably high gesture rate, would its speakers use an even higher gesture rate while speaking a second language at an early stage of learning?

Do low language proficiency and the difficulty in language production cause learners to make their gestures more informative? If dual gestures (gestures used to express the meaning of two-ness) are considered informative by nature, what are the differences between dual gestures in Arabic early learners of English in comparison to their native language?

2.5.2.2 First Language influence on second language learners' gesture

The properties of second language learners' gestures can be influenced by the gestural repertoire of their first language. Several studies have shown that many features of the second language speakers' gesture originate from their first language (see overviews in Gas,s & Selinker, 1992; Kellerman, & Sharwood Smith, 1986; Odlin, 1989, 2003).

The way in which the ground element in motion events is expressed in a certain language is sometimes gesturally maintained when speaking second language. In narrating motion events, certain elements are identified in relation to the action the characters are performing; Figure, ground and path (Talmy, 1991). Figure is the entity that is moving or

located in relation to ground, which is another entity. The transition of place of the entity is path. In example (3), 'a bottle' is the figure. It is moving on 'a cave', which is the ground element. Path is represented by the word 'out'.

Example (3)

"A bottle floated out of a cave" (adapted from Talmy, 1991)

If there is more than one ground element, speakers of satellite-framed language tend to combine them all with one path verb (see section 2.4.4 for definition and examples of satellite-framed languages). In example (4), 'school', 'garden' and 'cliff' are three ground elements compacted in one clause with an only verb 'ran'.

Example (4)

"The boy ran out of the house across the field to the cliff" (adapted from Slobin, 1996)

In contrast, if there is more than one ground element, speakers of a verb-framed language tend to express them in separate clauses, each with a single main verb. (See section 2.4.4 for definition and examples on verb-framed languages). For example, in Japanese, the above sentence would be equivalent to example (5). In (5), each ground element is associated with a different verb.

Example (5)

"The boy exited the house running, crossed the field and went to the cliff." (adapted from Slobin, 1996)

Further, in describing motion events, speakers of satellite-framed languages typically pay more attention to the movement and the dynamics of the motion (Slobin, 1996). Speakers of verb-framed languages, on the contrary, typically pay more attention to the location or the ground element. This difference of packaging of information of motion events has to do with the relationship between cognition and language and it is language-specific.

This difference of describing motion events across the two types of languages is reflected in gestures (Kellerman, and van Hoof, 2003; Kita and Özyürek 2003; Özyürek, Kita, Allen, Furman, and Brown, 2005; Stam 1999). (See section 2.4.4).

This representation of the above-mentioned ground element was investigated in speech and gesture of Dutch (a typologically satellite-framed language) speakers learning Japanese (a typologically verb-framed language) in a study by Yoshioka and Kellerman (2006). Second language speakers' language proficiency was low intermediate. The ground element was elicited through narratives of motion events. The expressions of the ground element of second language learners of Japanese were compared to ground expressions by speakers of native Dutch and native Japanese. It was found that the Dutch speakers produced gestures with a third of all the introductions of the ground reference, whereas the Japanese speakers produced gestures with two thirds of all the introductions of the ground reference (which is the double of what that Dutch speakers produced). In L2, it was found that speakers of Japanese as a second language tended to use the typology of their first language (which was Dutch) in referring to the ground element in their speech and gesture. Thus, regarding gesture, these second language learners preferred to maintain this certain property of their gestural repertoire. This means that their second language gesture was shaped by their first language typology.

Additionally, in another similar study of second language and motion events description, the result also showed an influence of the first language. The gestures of Spanish intermediate as well as advanced learners of English were investigated in comparison to native Spanish and English speakers in a study by Stam (1999). Instead of the ground element, the focus of this study was on the path. It was elicited through retellings of previously shown cartoons. It was observed that native Spanish speakers performed a gesture accompanying path verbs, whereas native English speakers performed that gesture along with

the path particle or the ground element. In second language speakers, it was found that they preserved their first language gestural pattern.

To the best of my knowledge, studies have only shown how intermediate and advanced second language learners express motion events. What about beginner learners of a second language? Would their gesture also be shaped by their first language typology? Further, I believe that the ways manner and path are expressed in gesture by Arabic speakers who are beginners in learning English while speaking L2 have not yet been investigated.

2.5.2.3 TARGET LANGUAGE INFLUENCE ON SECOND LANGUAGE LEARNERS' GESTURES

Features of second language learners' gesture can also be influenced by the target language. Second language speakers' gesture can be target-like. Second language learners can acquire gestural properties of the target language.

This can be seen in a study by McCafferty and Ahmed (2000). They investigated to what extent two groups of learners acquired abstract gestures, which were target-like, during their talk about marriage. One group had advanced learners who were untutored as well as immersed in the Americans' culture. The other group had advanced learners who were tutored. They found that the first group acquired more target-like language gestures.

Additionally, gesture space was examined in Japanese speakers learning French as a second language in France by Kida (2005). The study included intermediate as well as advanced learners. It was found that with increased proficiency, learners started using larger gesture space, which seems to be an L2 pattern as L1 French speakers use larger gesture space than L1 Japanese speakers. In their second language, their gestures were more like French (the target language).

To the best of my knowledge, studies have only investigated gesture space in intermediate and advanced learners (Kida, 2005). In the study of intermediate and Japanese learners' gestures, participants used larger gestures, which were target-like. Perhaps, there is

an explanation for acquiring larger gesture space other than being proficient in L2. The use of a larger gesture space may be due to difficulty faced in producing L2, and not because they acquired second language gestures properties.

In case of speakers of a language with considerably large gestures who are learning a language with considerably smaller gestures, would their L2 gesture be influenced by their first language or be target-like?

2.6 Theoretical framework for this project

This research project examines features of speech-accompanying gesture as well as factors causing them. It contains two main empirical studies, a cross-cultural study and a second language study.

2.6.1 Cross-cultural & Cross-linguistic study:

The first study is a cross-cultural and cross-linguistic study that compares between speech-accompanying gesture in English and Arabic speakers in terms of expression of manner and path, dual gestures, gesture space and gesture rate.

Whether Arabic is a verb-framed language or not is controversial. As seen earlier that Almurshidi (2013) claims that Arabic is a verb-framed language. However, Saidi (2007)'s claim mentioned earlier is in disagreement with that (see section 2.4.4).

Although speakers of Arabic may use a variety of ways to express manner and path, which one is used more dominantly? How are expressions of manner and path are reflected on gesture? These questions are investigated in the cross-cultural and cross-linguistic empirical study in chapter 3. Further on motivations as well as predictions are also provided in Chapter Three.

It has been seen earlier how speakers of the Australian aboriginal languages use the absolute frame of reference instead of relative frame of reference in describing directions or

locations (Haviland, 1993; Levinson, 2003). This phenomenon has been claimed to be an effect of language (Majid et al., 2004) (See section 2.4.3). If that is the case, then the question is if speakers of a language stopped using a certain grammatical form in their language, would that form still have an influence on their gestures?

Does the grammatical *dual* (referring to two-ness) form in Standard Arabic, which is not used nowadays in most informal Arabic dialects, still have an influence on Arabic speakers' gestures? What are the differences between dual gestures in English and Arabic? These questions are investigated in the empirical study in Chapter Three. More about on motivations of the study and expectations are also discussed there.

It has been seen how Italians' gesture have certain features such as the use of larger gesture space (Efron, 1972; Kendon, 2004) and higher rate (Barzini, 1964; Kendon, 1992, 1995). It has also been such characteristics can be caused be ecology (Kendon, 2004) (see section 2.4.5).

Do similarities regarding ecological features cause similarities in gesture? If Middle Eastern speakers are surrounded by similar ecological features as the ones surrounding Mediterranean speakers, would their gesture have similarities in terms of certain properties like gesture space and gesture rate? What are the differences between speech-accompanying gesture in English and Arabic in terms of space? In addition, what are the differences between rate of speech-accompanying gestures in English (representing a low gesture frequency culture) and Arabic (representing a Middle Eastern culture)?

Research Questions in the first study:

1. How do native speakers of English and Arabic differ in terms of their use of speech-accompanying gestures involved in the syntactic packaging of manner and path?

2. How do native speakers of English and Arabic differ in terms of their use of dual gesture?

3. How do native speakers of English and Arabic differ in terms of their use of gesture space?

4. How do native speakers of English and Arabic differ in terms of their gesture rate?

2.6.2 Second Language Study

The second empirical study investigates features of gestures accompanying speech in second language learners in light of what factors might have shaped them. Speech-accompanying gesture of first and second language learners are compared in terms of expressing manner and path, dual gestures, gesture space and gesture rate.

The ways in which motion events are expressed in gestures of intermediate and advanced second language learners have revealed the influence of the typology of their first language (Stam, 1999; Yoshioka, and Kellerman, 2006) (see section 2.5.2.2).

Would Arabic speakers who are at their early stages of learning English in an English speaking country gesturally express motion events using the typology of their source, too? Or would they show an influence of the target language? These questions, more on motivation of the study and predictions are addressed in Chapter four.

As it has also been noted earlier, low-proficiency second language learners are encountered with difficulties in producing second language speech (Gullberg, 1999). It has also been seen that perhaps due to such difficulties, second language learners have been observed to produce more speech-accompanying gestures during their L2 speech than their L1 (Gullberg, 1998; Sherman, and Nicoladis, 2004; Yoshioka, 2005) (see sections 2.5.1.1.1 and 2.5.2.1).

Based on this, will speakers of a language with a high gesture rate produce even more gestures when speaking L2 with low proficiency? Will they produce a higher gesture rate while speaking their L2 than while speaking their L1?

Furthermore, would early second language learners' gestures be more informative while speaking their second language than while they are speaking their first language? For example, would they produce more dual gestures during their L2 speech than L1 speech? These questions will be investigated in the empirical study in Chapter Four. Motivations and predictions are also discussed there.

Japanese speakers who were learning French in France in intermediate and advanced levels acquired the feature of larger gesture space of the target language (Kida, 2005) (see section 2.5.2.3). Would early learners of a second language in an L2 culture show a similar pattern? Would the gesture space of Arabic early leaners of English in an English-speaking country acquire a target-like gesture space, or would they maintain the same gesture space of their L1 while speaking L2? These questions as well as motivations and expectations are addressed in the empirical study in Chapter Four.

Research Questions in the second study

1. How do speakers vary in their use of manner and path gestures when they are speaking their first language (Arabic) and their second language (English)?

2. How do speakers vary in their use of dual gestures when they are speaking their first language (Arabic) and their second language (English)?

3. How do speakers vary in their use of gesture space when they are speaking their first language (Arabic) and their second language (English)?

4. How do speakers vary in terms of their gesture rate when they are speaking their first language (Arabic) and their second language (English)?

Chapter Three: Factors Influencing Features of Gesture of English and Arabic Speakers

3.1 Introduction

This study investigates cross-cultural variation in gestures in English and Arabic in terms of certain features: packaging of manner and path, dual gestures, the use of gesture space and gesture rate. The study also highlights the factors that might have played a role in shaping gestures with those features such as language, ecological background and cultural interaction. These factors are discussed in detail in the following sections.

3.1.1 Language Effect

One of the major factors that shape gestures is language. There are different types of language influences on sculpturing language-specific gesture features. Two of these are discussed here in detail; thinking for speaking and habitual thought.

3.1.1.1 Thinking for speaking

Language can shape gesture through thinking for speaking. Thinking for speaking is organizing the thoughts that are compatible with the language for the purpose of speaking (Slobin, 1987, 1996). For example, if the language has different tenses, its speakers must organize their thoughts taking the concept of 'time' into consideration. If a language has tenses, whenever its speakers are talking about an event in the past, they tend to present the event in past tense packaging by, for example, using past tense verbs. By contrast, a speaker of a language that does not have tenses does not go through that process. Thus, the mental representation of events during planning for speaking differs between these two languages.

Thinking for speaking gesture shaping was demonstrated in motion events. This is seen in the influence of speech syntactic packaging of spatial components on gestural representation (Kita, and Özyürek, 2003).

This syntactic packaging of manner and path in speech has been observed to be language specific (Talmy, 1985). That is, languages vary in how motion events are syntactically expressed. Accordingly, languages have been classified into satellite-framed languages and verb-framed languages (Talmy, 1991). Satellite-framed languages (such as English) are more likely to conflate manner with motion in the main verb as in 'floated' in (1a), and the path is conveyed in a particle known as a 'satellite' as in 'out' in (1b). Verb-framed languages, such as Turkish and Japanese are more likely to conflate path with motion in the main verb. Manner, if mentioned, is expressed in an adverbial or in a separate verb.

Manner and path can be expressed in speech in either a single clause or in two clauses, depending on the language typology. On the one hand, satellite-framed languages speakers such as English typically express manner and path in speech in a single clause as in example (1a) below. Verb-framed languages such as Spanish, on the other hand, typically convey manner and path in two separate clauses as in (1b) (Talmy, 1991; Allen et al., 2007).

Example (1):

a. "The bottle floated out" (Talmy, 1991).

b. "La botella salió flotando" (ibid).

Translation: "The bottle exited floating" (ibid).

This syntactic variation has an impact on the process of speech production and consequently, on the process of gesture production. A clause is recognized as a crucial processing unit for the formulation process of speech (Bock, and Cutting, 1992; Garrett, 1982; Levelt, 1989). Hence, it is easier for speakers of verb-framed languages to

conceptualize manner and path separately, so that the process of speech formulation can express each piece of information separately.

Since gestures demonstrate imagistic representations in the conceptual planning that is required for speaking (Alibali, Kita, and Young, 2000; Kita, 2000; Kita, & Özyürek, 2003; Hostetter, Alibali, and Kita, 2007; Kita, and Davies, 2009; Melinger, and Kita, 2007), manner and path may, as a result, be represented separately in gesture. (Kita, 2009). It has indeed been found that speakers of satellite-framed languages are more likely to conflate manner and path in their gestures. Further, gestures produced by verb-framed languages speakers are more likely to separate manner and path (Özyürek, and Kita, 1999; Kita, and Özyürek, 2003). They found that Turkish and Japanese speakers tended to separate manner and path information in gesture, while English speakers were more likely to conflate manner and path in gesture (ibid). It was concluded that gestural representation of manner and path is influenced by how manner and path information is syntactically expressed in that language (Özyürek et al., 2008).

The gestural packaging of information is affected by the online choice the speaker makes in regard to the syntactic packaging. This was found in a study in which English speakers produced descriptions of cartoon clips that were specifically made for the purpose of eliciting single-clause descriptions as well as two-clause ones as in "he rolled down the hill" and "he went down while he was rolling", respectively (Kita et al., 2007). It was found that when these speakers used a single clause to describe the events, they produced a single gesture. However, when they used two clauses, they also produced two gestures (ibid).

There is controversy as to whether Arabic is a verb-framed or satellite-framed language. Almurshidi (2013) claims that Arabic is a verb-framed language. She explored expressions of motion events among Arabic speakers. In her study, she compared expressions of motion events between fifteen Arabic speakers from various Gulf countries to

those of English speakers from Feiz (2007). Aspects of motion events were expressed through elicited narratives of Chafe's Pear Story (1980). She used a discourse analysis approach by applying Talmy's typological framework to the narratives of the motion events. Her study provides a descriptive analysis of Talmy's (2007) typology of Arabic as a verb-framed language by giving examples from her data.

She concluded that Arabic is a verb-framed language as the Arabic speakers in her study produced utterances that are typically produced by verb-framed language speakers. This is based on some observations such as the following. First, the Arabic speakers in her study used a variety of path verbs such as *fall*, *pass* and *descend*. Second, they rarely used manner verbs. The English speakers from Feiz (2007) typically behaved as satellite-framed language speakers do. For example, they used many manner verbs. They also used manner verbs in combination with path satellite (see sections 2.4.3 for more information on verb-framed and satellite-framed languages, and how they treat elements of motion; manner, path).

However, this study lacks quantitative data regarding the claim that Arabic is a verb-framed language. Also comparing speakers from different studies might not be valid. For example, although the speakers watched the same clips and narrated the same story, they might have been tested in different circumstances, which may have affected the results.

Therefore, it is necessary to conduct a study that provides quantitative as well as qualitative empirical evidence on Talmy's (2007) typology of Arabic as being a verb-framed language. The current study provides quantitative and qualitative data to test Talmy's typology on Arabic. Further, The Tomato Man videos (Özyürek, Allen, & Kita, 2001; Özyürek, et al., 2007, Kita, et al., 2008) (which were specifically made for the purpose of eliciting motion event aspects) are used to elicit motion event expressions. The Arabic speakers in the current study have only been in the United Kingdom (the L2 environment) for three months at most. This should eliminate the L2 influence on their L1.

However, other studies have suggested that Arabic does not fit into Talmy's typology. It has been claimed that Tunisian Arabic should not be classified as a verb framed language because Tunisian Arabic applies other methods of expressing motion events than simply conveying path in a verb clause and motion in another separate clause (Saidi 2007).

One of the structures Saidi (2007) used as evidence for her claim is that sometimes manner and path are expressed by two verbs within one clause as in example (2a), which is the example she used in her paper to explain this point. However, this example cannot be used as evidence that Arabic does not fit into Talmy's (1991) typology. This is because of the following two reasons.

Firstly, this structure is not exclusive to Tunisian Arabic. It also exists in Standard Arabic. Examples for this grammatical structure can be found in Quran such as 'in ease and abundance' in example (2b). In addition, the exact example can be used in other dialects such as Saudi Arabic dialect as in.

Example (2):

a. "it-t fol   dæ il   je- r-i   li   l-madisæ

The child   enter   run   to   DET-school" (Saidi, 2007)

b. "O Adam, dwell, you and your wife, in Paradise and eat therefrom in [ease and] abundance from wherever you will" (http://quran.ksu.edu.sa/translations/english/6.html, n. d.).

Secondly, although the second word does have a verb root, it is not considered a verb in Arabic grammar (Alhashemi, 2017; http://quran.ksu.edu.sa/tafseer/eerab/sura2-aya35.html, n. d.). It is considered an adjective for an omitted object, which is assumed to be 'entering' in (2b). It describes the status of the doer of the action at the time of performing the action, as an adverb. Instead of translating it into 'run', perhaps 'running' or 'by running' could be a more accurate translation.

Example (2a) is indeed one of the examples in Arabic that conflate manner and path within one clause. Though Arabic can use both verb-framed and satellite framed patterns, it is not clear which one is dominant in spontaneously produced descriptions of motion events. Saidi (2007) has not provided quantitative data for her claim. This is one of the issues investigated quantitatively and qualitatively in this study.

I will also investigate how possible typological differences in linguistic expressions of motion events in English and Arabic are reflected in iconic gestures accompanying motion event descriptions. Manner and path descriptions in this study will be elicited through stimuli that were specifically designed for this purpose (Özyürek, Allen, and Kita, 2001; Özyürek, et al., 2007, Kita, et al., 2008).

Based on findings from previous studies, it is predicted that English speakers will produce more single clauses to express manner and path (Allen et al., 2007). It is also expected that English speakers will conflate spatial elements of manner and path in gestures when both of them are mentioned, as found in previous studies (Özyürek, and Kita, 1999; Kita, and Özyürek, 2003). To what extent Arabic speakers will express the manner and path in separate clauses is an open question, which is similar to the speech patterns found in a study conducted by Almurshidi (2013). If Arabic speakers express manner and path in separate clauses, it is predicted that they will separate gestures following the speech syntactic packaging of the two components as found in Özyürek, and Kita (1999), Kita, and Özyürek (2003) and Kita, et al. (2007). However, if Arabic speakers express manner and path in a single clause like English, then gestures should resemble English speakers' gestures, and expressing manner and path in a single gesture.

3.1.1.2 "Whorfian effect" of habitual thinking

Language can also have an influence on gesture shaping through habitual thinking. According to this theory, language can restructure cognition (Whorf, 1997). The way speakers of a certain language habitually think about certain concepts is sometimes constructed by semantic categories of the language even when speakers are not speaking the language. That is, linguistic effects can go beyond thinking-for-speaking as discussed above. Grammatical patterns derived from a socio-historical perspective create these habitual thoughts (Gumperz, and Levinson 1991). For example, the use of plurality in a certain language creates a certain image in the mind of the speaker, and that image becomes the way the speaker thinks of countable objects (Whorf, 1997). Whorf (1997) compared this concept between western European languages and Hopi. He argued that plurals in the former included nouns that referred to an objective group such as 'men' and the those that had a sense of cyclicity, and could not be experienced in real life as a group, as in 'days'. In contrast, in Hopi, only countable nouns that could make up a group in reality are pluralized such as 'men', whereas nouns with cyclicity impression were not pluralized (ibid). These linguistic patterns in the above-mentioned languages created an image for these nouns in the minds of their speakers. More precisely, the way western European languages speakers used their languages to speak about cyclicity plurals (as in 'days') developed an imaginary plural in their minds, whereas in Hopi speakers' minds, such an imaginary plural of nouns with the impression of cyclicity did not exist. Thus, this effect of language on thought is language-specific.

Gestures can be used as a tool to reflect language specific habitual thoughts. In a study of Australian aboriginal languages, it has been observed that speakers of Guru Yimithirr, instead of using a relative frame of reference (right and left), used an absolute frame of reference (north, south, east and west) whenever linguistically describing relative

locations and directions in space, even for describing the location of an item on one of their body parts (Majid et al., 2004).

This was reflected in the way these speakers gestured. When they gestured to describe locations and directions, they oriented their gestures in an absolute way; that is, gestures were oriented correctly in the absolute space (north, south, east, and west) (ibid).

Furthermore, these speakers remembered relative locations and directions in the absolute space, even in memory tasks that did not involve speech. This study claimed that this way of using gesture was due to the 'Whorfian' language effect, which shaped the way these speakers' habitually thought about space, even if they were not talking about it.

Thus, providing additional evidence is important to demonstrate that gestures can reflect habitual thoughts, which are constructed purely by language, rather than by culture or ecology. This may be done by examining the effect of a certain grammatical form of a particular language on the gestures of its speakers when they are not using that form. This is because when the grammatical form is not used in the speech concurrent with the gesture, but it still influences the gesture, then it is not an effect of thinking-for-speaking (Slobin, 1991). In such cases, the grammatical form may influence gesture via habituation thought, namely, it may have a Whorfian effect, which manifest itself as in gesture.

In this study, the effect of the grammatical dual form of Standard Arabic on the minds of the speakers of everyday Arabic (in which this grammatical form is not used) is investigated. The dual grammatical form in Standard Arabic is explained further in the following paragraphs.

Dual form is used to express the concept of 'two-ness' (Alhashemi, 2017). This means that this category is used to refer to two. It is expressed in nouns, pronouns and verbs (Alhashemi, 2017; Haywood, and Nahmad, 1965).

In nouns, it refers to two of the same type (Alhashemi 2017). In other words, it means 'double'. It is conveyed by adding dual suffix 'ān' to the nouns as in examples (3a) and (3b) (Haywood, and Nahmad, 1965).

Dual pronouns are also used to represent two of the same type (Haywood, and Nahmad, 1965). Particular pronouns are used to express dual-ness. The personal dual pronouns in examples (3c) and (3d) are used for both males and female.

In verbs, when the action is performed by two, dual suffix is added to its stem. If the verb represents an action that was performed in the past by two males, the 'ā' suffix is added to end of the stem as in (3e). If it was performed by two females, a 'ta' suffix is added to the end of the stem as in (3f). If the verb represents an action that is performed in the present or to be performed in the future by two males or females, the 'ān' suffix is added to the end of the stem of the verb as in (3g).

Example (3)

a. " ملك malikun, a king; ملكان malikāni, ملكين malikaini, two kings" (Haywood, and Nahmad, 1965; 40).

b. " ملكة malikatun, a queen; forms the dual ملكتان malikatāni, two queens" (ibid).

c. " أنتما ântumā, you (two)" (Haywood, and Nahmad, 1965; 44).

d. " هما humā, they (two)" (ibid).

e. " كتبا katabā, they (two) wrote" (Haywood, and Nahmad, 1965; 45).

f. " كتبتا katabatā, they (two) wrote" (ibid).

g. يكتبان yaktoban (meaning they write).

The effect of the grammatical dual forms of Standard Arabic on the gestures of Saudi Arabic speakers might be an ideal case to be examined here. This is due to two reasons; Standard Arabic is not spoken in everyday life, and its 'dual' grammatical form is no longer

used by speakers of informal Arabic. These reasons are discussed in the following paragraphs.

There are twenty four Arabic-speaking countries (http://www.ambergh.com/learn-arabic/the-arab-world, n. d.). In these countries, several Arabic dialects are being spoken. All of them derived from Standard Arabic. The Arabic language is the language of the Quran. It has appeared "as a world language in the seventeenth century CE" (Versteegh, 2014). Standard Arabic is considered to have a prestigious position and it is considered to be the language of culture, religion and education (ibid).

Nowadays, in Arabic speaking countries, Standard Arabic is not used in informal speech in everyday life. It is used while reading Quran, conventional prayers, Arabic school curriculums, and official statements in a large part of the media such as Arabic news programs.

Although various Arabic dialects are grammatically structured in the same way as Standard Arabic, dual forms are not used in informal Arabic. Specifically, dual forms are not used in informal Saudi Arabic. Saudi Arabic speakers express dual meaning in speech in the same way as if they are speaking about the plural form. If the conceptual category of 'dual' influences gestures while speaking in informal Arabic, then this cannot be caused by the effect of thinking-for-speaking. This is because in thinking for speaking, as it has been seen earlier in section 1.1.1, the grammatical form reflected on gestures is also used in speech. Therefore, if the concept of dual-ness is observed in Saudi Arabic speakers' gestures, it has to be caused by language-specific habitual thought, shaped by Standard Arabic.

Do Arabic speakers' gestures reflect how Arabic speakers habitually think about dual-ness? Has Standard Arabic created habitual thought patterns of dual-ness that are expressed even if speakers are not using the language? This study will answer these questions in a

cross-linguistic comparison of dual-ness in English and Arabic in terms of speech and gestures.

3.1.2 Ecological background

Does ecology influence gesture use? Although there is no empirical evidence to support the idea, it has been claimed that ecology (environment) has the potential to influence gesture use. This has been suggested by scholars such as Efron (1972), Murphy (1942), De Jorio, and Kendon (2000), and Kendon (2004). This means that the characteristics of the environment in a given culture where communication occurs may play a role in shaping gesture. Examples for these characteristics include how busy the environment is, the activities that are taking place in the streets, the arrangement of the buildings, the nature of the people and even the climate.

If the claim that ecology can shape gesture proves to be true, then variation in ecological features across cultures would create cross-cultural variation regarding gesture such as gesture space and gesture rate (Kendon, 2004; Mayer, 1884). As a result, these gesture properties would be different across cultures. This is discussed further in the following paragraphs.

Gesture space varies across cultures. For example, the gestures used by Eastern Jewish (originally Lithuanian and Polish) and Southern Italian (originally Neapolitans and Sicilians) immigrants in New York were compared in terms of various features, one of which was gesture space (Efron, 1941, 1972). Efron found that the Italians lifted the upper arm and used the whole arm. Their gestures started from the shoulder not from the elbow. The Jews moved only their forelimbs from the elbow, keeping the upper arm near the body (ibid). This illustrates the expansiveness of Italians gesturing.

Efron speculated that the differences between the two groups may result from the differences between the environments each group experienced, when they used to live in

85

Europe. Murphy (1942) emphasized this line of thinking (though without evidence). He mentioned that, on the one hand, the Italians' use of gesture seems to be an expression of an environment where space is free and the conversation is more like a dance, or a song, regarding its expressive value. On the other hand, the Jewish gestures seem to be a gesture of escape under the social and economic persecution they experienced in Europe. Also, the Jewish gestures seem to be a means of coping with difficulties, in case of a struggle. Further, the Jewish gesture gesture seems as "a gesture of localized aggression directed to the only immediate object" (ibid).

Efron's observation about Italian immigrants' gesture features are corroborated by a study on Italians' gestures (Kendon 2004), in which gestures of a Neapolitan Italian speaker and an English speaker were compared. It was observed that Neapolitan Italians' gesture tend to employ larger space. Their gestures are mainly performed above the waist of the addressee and frequently at or over the shoulder level. This group tries to make their gestures as obvious as possible to their interlocutor (ibid).

In addition to the use of gesture space, another gesture feature that could be attributed to ecological factor is gesture rates. This is because higher gesture rates may be suitable for ecology where communication relies relatively more on gesture. It is proposed that speakers with Mediterranean backgrounds have a high gesture rate especially when compared to Northern European cultures like Britain It was also recorded that Italian speakers produce a high frequency of gestures (Barzini, 1964; Kendon, 1992, 1995). By contrast, British English speakers are recorded as producing low gesture rate (Graham and Argyle, 1975).

Thus, it seems from the above-mentioned studies that gestures of Italian speakers especially Southern ones have certain characteristics. These characteristics may differ from those of speakers with other cultural backgrounds. According to the claim that ecology may influence gesture use, such differences might result from ecology.

De Jorio, and Kendon (2000) discussed the ecological and cultural factors that may have influenced the size and rate of gesturing by Italians from Naples. The nature of everyday life in Naples may have an influence on the Neapolitans' use of gesture. Naples has a relatively large population, and since the weather there is comfortably warm, its inhabitants spend more time outdoors, which makes it possible for them to mingle with each other (Kendon, 2004). It is suggested that Italian people speaking in the busy streets of Naples may have to compete for attention because of the noise. Furthermore, for the Neapolitan, life in the street is like a theatre, and while speaking, s/he is not only addressing her/his interlocutor but all of the bystanders as his audience. Additionally, people in Naples would depend on gesture as a means of communicating from balcony to balcony in their several-storey buildings or from balcony to street (Mayer, 1848 [1840], p. 19) in (Kendon, 2004). This may explain why their gestures use large space and they produce gestures frequently.

However, none of the above-mentioned suggestions have been empirically tested. Although Efron (1972) suggested that his results could be explained by environmental factors, he clearly stated that his study does not provide evidence for that. Kendon (2004) also stated that his suggestion that ecology may influence the use of gesture needs to be examined in an empirical comparative study.

Nevertheless, if ecology does influence gesture use, then perhaps being surrounded by similar ecological features may lead to similarities between gesture features in Saudi speakers and Italian speakers regarding the use of gesture space and gesture rate when compared to English speakers. The resemblance in ecology between Saudi Arabian cities and Italian cities might be explained through the similarities between certain ecological features in Jeddah (a Saudi Arabian city) and Naples (the Italian city mentioned in the above paragraph).

The image of Naples brought to us through Mayer's (1848) descriptions brings to the mind a portrait of Jeddah. Jeddah is one of the largest cities in Saudi Arabia (http://www.the-

). It is located in the west coast of the Kingdom of Saudi Arabia by the Red Sea. It is the seaport and airport of the holy city of Makkah. Jeddah, same as Naples, has a large population. It is populated by 3.9 million people (Ziegler, 2017).

For several years, Jeddah has had traditional shopping areas called 'souqs'. A souq usually has many shops that have various goods including food, clothes, household ornaments as well as parts of automobiles (SCTA, 2017). It is considered very noisy due to the shopkeepers shouting out loud and sometimes even singing in order to advertise their goods or arguing with customers about bargains. This noise can also be caused by the activities that are being held in the streets of the souqs, such as poets reading their poems out loud or when traditional dances are being performed. If noise provokes the speakers to use larger gesture space and a higher gesture rate in Naples as suggested by De Jario, and Kendon (2000) and Kendon (2004), then the situation in Jeddah might be similar.

These shops are spread around multi-story buildings with balconies. Residents of these buildings are likely to communicate with people in the streets while standing in their balconies, with shopkeepers and with people standing in other balconies in the same or different buildings (Basil, and Kay 1979). If such ecological factors do influence gesture use, as suggested by De Jario, and Kendon (2000) and Kendon (2004), then it might result in the use of larger gesture space and a higher gesture rate by the communicators in this situation.

The hypothesis here is since the Mediterranean and the Middle East areas share certain environmental features, and according to previous scholars' suggestions, like Efron (1941, 1972) and Kendon (2004), it is speculated that speakers from these cultural backgrounds may share similar gestures. Accordingly, it is predicted that English speakers and people from Northern Europe use less gesture space and gesture rate, (Efron1941, 1972, Müller 1998) when compared to Arabic speakers. Arabic speakers are expected to have

similarities in terms of gesture space and gesture rate with speakers from Mediterranean cultural backgrounds such as Italian speakers (Barzini, 1964; Kendon, 1992, 1995).

However, it should be noted that this current study does not empirically test the influence of ecology on gesture use in the above-mentioned cultures. Therefore, it will not provide evidence for the effect for ecology on gesture. It is, however, an area in the literature that needs more attention. I join Kendon (2004) in his suggestion for an empirical comparative future study on the influence of ecology on gesture use.

3.1.3 Cultural interaction

It might be common knowledge that gesture features correspond to national and linguistic borders. This means that, people from a certain linguistic or national background have similar gesture features. Perhaps that is why we might have noticed that many stereotypically Italians, to a great extent, use similar gestures. Also, in this regard, we might have observed that gestures of people who come from Arabic speaking countries are similar. This may not be surprising taking into our consideration the cohesive influences created by sharing a national identity and speaking a common language (Morris, 1979). A reasonable explanation for this phenomenon perhaps lies the possibility that certain gesture features such as the use of gesture space and gesture rate correspond to national as well as linguistic identity. This has been demonstrated in earlier literature, such as Italians' high gesture frequency (Barzini, 1964; Kendon, 1992; Kendon, 1995), and Spanish speakers' use of more salient gestures (Müller 1998).

However, in case of interaction among different cultures, these gesture features may be subject to change, especially if this interaction lasts for a considerable period of time. Previous research has shown how gesture features can change as a result of cultural interaction. For example, in a study by Effron (1942, 1972), he highlights that such change in gesture features result from becoming assimilated into a new society. In his study, he

compared gesture features such as speed, the plane where they are performed in relation to the body and the body parts used for gesturing in recent Eastern Jewish and Southern Italian immigrants. He also compared the same gesture features between Eastern Jews and Southern Italians who were more assimilated in the American society. He found fewer differences between the assimilated groups than between the recent immigrant groups (see sections 2.4.5 and 3.1.2). This implies that cultural interaction can cause change in the above-mentioned gesture features. Accordingly, it might also be possible that cultural interaction can affect other gesture features, such as the use of gesture space and gesture rate.

Further, interaction among different cultures may cause certain gesture features to spread to another culture. It has been observed in the literature how certain emblems spread in a particular area as a result of interaction with other cultures. For example, in a study by Morris (1979), he traced the use of the head toss emblem meaning negation in Southern Italy. He explained that before it was used in Italy, this emblem had been widely used in Greece. The emergence of this gesture in Southern Italy might have evolved from Greek influence., because of the common history between southern Italy and Greece at the time when Odysseus visited the Cimmerians' land in Southern Italy. In addition, the Greeks were involved in trading in this part of Italy between 1400 and 1200 B.C. It is conceivable that the use of gesture space and gesture rate have become social conventions, like the symbolism of emblems. If so, the use of gesture space and gesture rate may also spread, as emblems do. This means that interaction among different cultures may cause gesture features to spread.

An example of such cultural interactions is one that occurred between Italians and Arabs. A strong connection has been established between these two cultures, due to various reasons such as historical political incidents and economic interaction. This is discussed further in the following paragraphs.

Trade is considered a means through which people from different cultures can come into contact. Throughout history, it appears that trade played a significant role in cultural interaction. Those merchants would personally transport their goods to their buyers and mingle with inhabitants of their destination towns and also with the communities they met on their journey to the marketplace. is recorded in existing history of trade literature. Examples of how trade can prompt cultural interaction among different cultures are the caravans that used to travel through the famous Silk Road, which connected China to Europe (http://factsanddetails.com/world/cat52/sub331/item1182.html, 2010). Merchants used to travel on the Silk Road in caravans with their goods carried by camels. On their way, they passed through towns. When they passed through large, civilized towns, they would stay there for longer periods of time. During that time, they would rest, feed their animals, buy and sell goods. Moreover, merchants learned the languages and customs of the inhabitants of the areas they passed through so that they could negotiate successfully (https://en.unesco.org/silkroad/about-silk-road, n. d.).

It has been reported that the Arab-Muslim merchants in Egypt, Tunisia and Morocco used to travel to Southern Italy (Sicily) to sell their goods in the eleventh century (Greif, 1989). Taking the nature of these economic interactions into consideration, it is believed that along with exchanging goods, they also exchanged culture. Frankincense and myrrh were brought to the Roman markets by Arabian merchants in camel caravans from Shabwah in Hadhramaut in the southern region of the Arabian Peninsula through the Incense Route (a route that links the Eastern and Southern sources of incense with the Mediterranean region) around 1500 B.C. (https://www.metmuseum.org/toah/hd/ince/hd_ince.htm, 2000; https://web.archive.org/web/20070908173824/http://www.botschaft-jemen.de/Geschichte.htm, n. d.). Such trade routes nurtured a unique setting for cultural

interaction between mercenaries, merchants, pilgrims and nomads who came into continuous contact with each other (https://www.metmuseum.org/toah/hd/coin/hd_coin.htm, 2012).

In addition to trade, historical and political events may have enabled cultural interaction between Italians and Arabs. In 652 AD, twenty years after the death of Prophet Mohammed (peace be upon him), the Arabs-Muslims first came to Sicily from Syria, which was a new Arab province at that time (Metcalfe, 2009). That was the beginning of the rise of the Arabic and Islamic power in Southern Italy. In 831 AD, Palermo became ruled by the Arab-Muslims, who ruled for four centuries. In 840s AD, the west and south-west territory became part of the Muslim settlement in Sicily. Later, all of Sicily became a Muslim settlement with Palermo as its capital (ibid). It is still the capital of Sicily now (https://www.sicilianplaces.co.uk/blog/a-guide-to-palermo-sicilys-capital., 2018).

The Arab-Muslims also reached Sardinia (the biggest Italian island after Sicily) in 809 AD (http://www.alukah.net/culture/0/23492/#_ftn10, n.d.). Arab-Muslims ruled it for about a hundred years.

The Arab-Muslims also came in contact with Italians in the Italian mainland. They reached Lucera (Metcalfe, 2009), which is the last Arab-Muslim colony on the Italian mainland. They lived there for four hundred years (https://munchies.vice.com/en_us/article/nzkk3g/the-edible-legacy-that-arabs-left-in-southern-italy, 2016). They also established an Islamic state in Bari in 847, which lasted until 871 AD (http://www.alhayat.com/Articles/27627999/-إعادة-كلبة-إلى-أصحابها-في-ألمانيا-بعد-العثور- إيطاليا-الإسلامية-/عليها-في-سويسرا, 2018; Metcalfe, 2009; https://raseef22.com/politics/2017/08/11/قصة-صعود-وانهيار-ال/, 2017).

The Muslim presence in Southern Italy at that time resulted in cross-cultural interactions such as conversions, marriages and trade. (Di Branco, and Kordula, 2013). These historical incidents were often accompanied by migration (ibid). In addition, In 800s AD, the

Arabic language became widely spoken in Sicily. By 948 AD, Arab Sicily was one of the most prosperous cities in Europe intellectually, economically and artistically (http://www.bestofsicily.com/mag/art168.htm, 2005; Metcalfe, 2009).

Trade, historical events and social interaction may have enabled cultural interactions between the two cultures. That cultural interaction has subsequently influenced many areas of peoples' lives in that region, including knowledge, language, art and religion (Metcalfe, 2009). According to this, and based on the studies of Efron (1972) and Morris (1979), such cultural interactions may have also influenced the gestures of people from these two cultural backgrounds. It is possible that their gesture features changed, adapted or spread from one to another.

In conclusion, the hypothesis here is that when people from different cultural backgrounds interact (especially if the interaction lasts a longer period of time), such cultural interaction may affect their gesture features. In other words, it is expected that people from these cultures have similarities regarding their gesture features.

Therefore, it is speculated that the Arabic speakers in this study may share some similarities with regard to certain gesture features with the Italian speakers from Efron, (1942, 1972), Barzini (1964) and Kendon (1992, 1995). It is predicted that Arabic speakers use larger gesture space than English speakers (Graham and Argyle, 1975). It is also predicted that the Arabic speakers use a higher rate of representational gestures that the English speakers.

Main Research Questions:

1. What are the differences between English and Arabic in terms of syntactic packaging of Manner and Path of motion event in speech and gestures?

2. What are the differences between English and Arabic in terms of gesture space?

3. What are the differences between English and Arabic in terms of gesture rate?

4. What are the differences between English and Arabic in terms of dual-ness of speech and gestures?

3.2 Methodology

3.2.1 Mixed research methods approach

Three main research paradigms have been identified; Quantitative, qualitative and mixed (Dornyei, 2007). Quantitative research is applied through procedures of data collection that lead to numerical results. These results are, then, analyzed using a statistical method such SPSS for analyzing questionnaires.

Qualitative approach is applied through procedures of data collection that lead to non-numerical data (ibid). Then, data is analyzed using a non-statistical method as in recording interviews and descriptively analyzing them.

Mixed research methods approach a mixture of the above two research paradigms. It is a combination of quantitative and qualitative research methods applied at the phase of data collection or the analysis (ibid).

Mixed research methods paradigm is considered more valid as well as reliable when compared to other research paradigms (Backhaus, 2007). This is probably due to the way it provides a considerably complete picture of the phenomenon under investigation (Hashemi, 2012). It provides quantitative measurements of the results as well as deeper qualitative descriptions of these results. Therefore, mixed research paradigm is used in this research project.

In this research project, the two constituents of the mixed research method approach are applied. The quantitative element is applied by collecting numerous data and applying SPSS tests such as t-test, paired t-test and the two way ANOVA. After that, samples of the results have been examined closely and described in more depth.

94

3.3.1 Data Collection:

The data was collected at the University of Birmingham in Birmingham, United Kingdom. A number of Arabic and English participants were asked to watch short silent cartoon videos and then describe the movements of the characters to a native speaker. The participants' performances were videotaped and analyzed with regard to gesture and speech.

3.3.1.1 Participants:

There were two groups of participants; Saudi participants who spoke Arabic as their first language and British participants who spoke English as their first language. They grew up in families speaking their first language, and even if they learned other languages in school, they only spoke their first language in their everyday life.

The Arabic participants filled in questionnaires about their linguistic backgrounds. Because the Arabic participants are residents in a second language (an L2) culture, it was crucial for them to meet with certain criteria with regard to their L2 exposure and English L2 proficiency.

In terms of their L2 exposure, they have been in the United Kingdom for three months at most. Like most Saudi students of their age, they have may have watched many English-speaking movies or programs, although all of these are translated into Arabic.

With regard to their L2 proficiency, they are considered beginners. They learned English as a second language in schools in Saudi Arabia. In the UK, most of them are enrolled in beginners' classes in various language learning institutions.

English participants were recruited through advertisements that were displayed in places where they could be seen by many students, such as libraries and canteens around universities in Birmingham. Arabic advertisements were displayed in places where Arabic students in Birmingham gather, such as language learning centers and universities. The advertisement contained information about the study, such as the type of study, which was

psycholinguistic, the place, contact information of the researcher and the financial compensation for participation. However, gestures were not mentioned in the advertisement, so that participants would produce gestures more naturally. It also included the main requirements that the participants should have, such as speaking British English in case of English participants and Saudi Arabic in case of Arabic participants as their first languages as well as the required age, which was nineteen to twenty nine years old.

The total number of subjects who participated in the base study was 30. In the English group, there were 6 females and 10 males. In the Arabic group, there were 15 participants in total, 4 of whom were females and 11 were males.

3.3.1.2 Task

The main objective of the study was to compare speech-accompanying gestures in English and Arabic with regard to certain features; syntactic packaging of manner and path, dual gestures, gesture space and gesture rate. The story-retelling task was used in the experiment in order to ensure the occurrence of all of the above-mentioned features to be investigated.

The story-retelling task using a cartoon clip was inspired by previous gesture studies such as those of Berman (1988), McNeill (1992) and Kita, & Özyürek (2003). Speech production that is based on watching an animated cartoon video has been used in previous gesture studies that have dealt with first and second language production in a range of languages as in McNeill (1992). In those studies, participants are usually shown short segments of the cartoon video so that their memories are not taxed, and then they are asked to re-tell the cartoon story.

3.3.1.3 Material

Story-retelling of a previously shown animated cartoon was used to elicit first language speech and speech-accompanying gesture production. The cartoon videos that were used as stimulus in this case were The Tomato Man (Özyürek, Kita, and Allen, 2001). The Tomato Man collection contains ten animated cartoon videos and two additional videos, which were used to practice the exercise. The videos last from 6 to 15 seconds, thus, no video clip taxes the memory and each clip allows the story to be dealt with as a whole (Gullberg, 1998: 81).

The stories in each clip of the Tomato Man videos are very clear and easy to understand (they contain one main event), so participants do not feel the need to invent a story. They only need to find a way to explain the story to the listener. The Tomato Man videos are silent with no verbal or lexical elements in any language, so even if they were to be retold in L2, participants would not have to go through the translation process.

In the Tomato Man series, there are two characters, namely the Tomato Man and the Green Triangle. The Tomato Man is a red, ball-shaped character, and the Green Triangle is a green, triangular character (S. Allen et al. 2007). In this study, participants could name the characters as they pleased. The landscape environment in which the action takes place is uncomplicated. There are three main events in each of the Tomato Man videos; one at the beginning, one in the middle and one at the end of each clip. All three events were used in this study to elicit certain types of speech and gesture. This is discussed in detail in the following sections.

97

Manner and path

Because of the design and plot of the videos, the Tomato Man series has been used as a stimulus in previous studies of motion events (Özyürek, Allen, & Kita, 2001; Özyürek, et al., 2007, Kita, et al., 2008) to elicit verbs of motion as well as gestures referring to motion.

In this study, the mid-point event was used specifically to elicit manner and path because it demonstrates manner and path occurring simultaneously. These occurrences are constructed of five manners (Roll, Rotate, Jump, spin and Tumble) and three paths (Up, Down and Around). They make up the following combinations: Roll+Up, Roll+Down, Rotate+Up, Rotate+Down, Jump+Up, Jump+Down, Jump+Around, Spin+Up, Spin+Down and Tumble+Down. 'Roll' encodes the manner in which the character constantly turns on its horizontal axis (on a surface), whereas 'Spin' is when that character turns on its vertical axis. 'Rotate' and 'Tumble' encode the manner of the character continuously turning around the vertical axis and moving through the air vertically whether upwards or downwards. 'Jump' encodes an up and down manner movement of the character (see Figure 1 and Figure 2 on the following page).
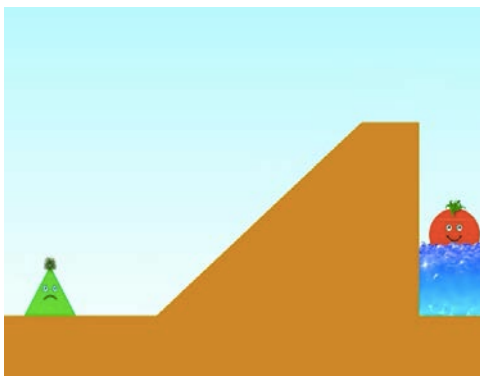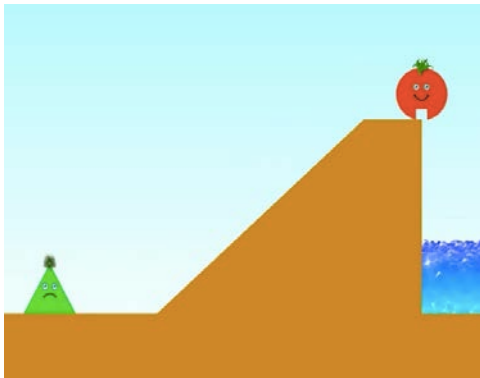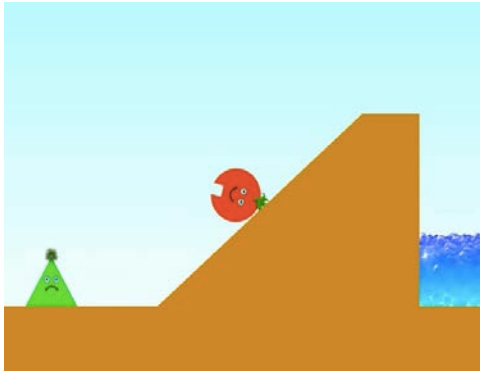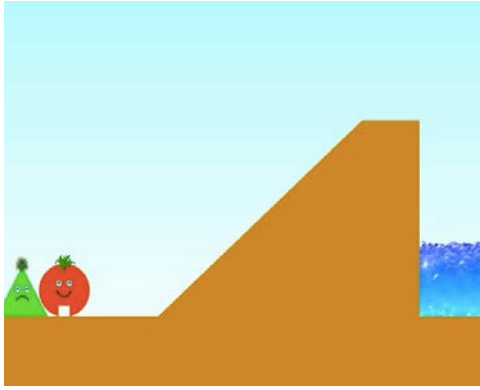
Figure 1: Snaps from the tomato man video Roll+Up (Özyürek, Kita, and Allen, 2001)
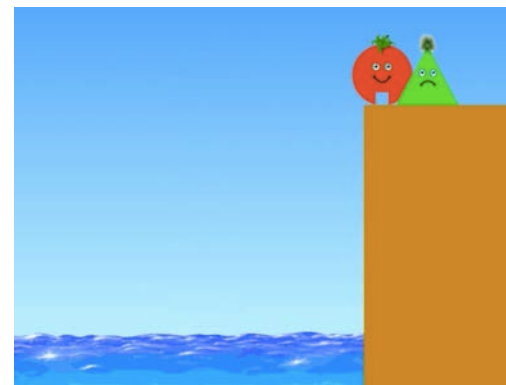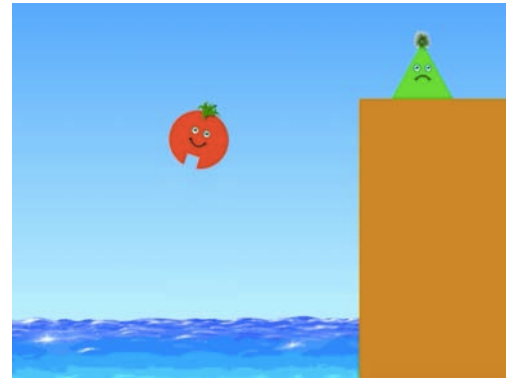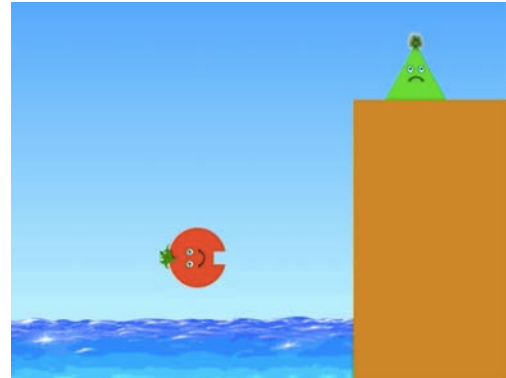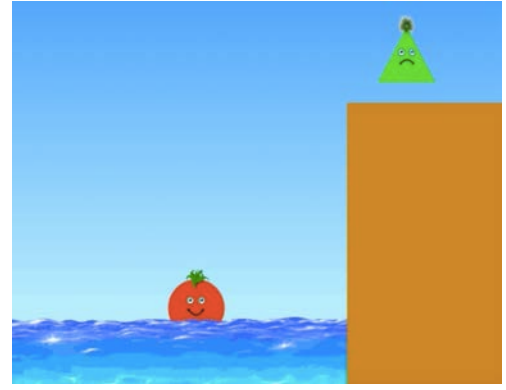
Figure 2: snaps from the tomato man video Rotate+Up (Özyürek, Kita, and Allen, 2001)

Dual-ness

The Tomato Man videos were also used as the stimuli in the comparative study that investigated dual gesture. Specifically, the first and the final events of these videos were used for this purpose, because these events are performed by both characters, namely the Tomato Man and the Green Triangle. These two events were selected to elicit verbal descriptions of the dual and non-dual events from participants.

'Dual events' in this study refers to scenes in which both characters perform an action in which they play the same role. These events occur in clips in which the Tomato Man and the Green Triangle engage in performing an action such as entering or leaving a scene together.

These videos are also used to encourage participants to describe 'non-dual' events in speech. Non-dual events in this study indicate events in which two characters perform an action together although each character plays a different role in the action.

The Tomato Man videos include such non-dual events. For example, at the end of the JUMP+DOWN clip, Tomato Man gives a banana to another Tomato Man. Participants might describe this event using clauses like 'the tomato gives the banana to another tomato'. This clause conveys a non-dual event because although there are two characters participating in performing an action, each one holds a different role; one tomato gives, the other tomato receives.

With regard to gesture, the Tomato Man videos help to elicit spontaneous representational gestures, simultaneously accompanying all of the types of clauses mentioned in the above sections, i.e. manner and path, dual and non-dual clauses. Therefore, they are likely to encourage participants to produce motion and dual gestures. All of the representational gestures that participants produced throughout their descriptions of the videos were studied in terms of gesture space and gesture rate.

3.3.1.4 Procedure:

Participants were tested individually in a quiet room in the University of Birmingham. As a participant arrived, s/he was asked to sit on a chair that had been set especially for participants. They were asked to complete consent forms and questionnaires. These are discussed in the following paragraphs.

Before the experiment, participants filled in forms of consent to permit the use of the audio and video records of their narration for the purpose of scientific research (see Appendix A). In addition to seeking permission for their recorded narrations to be used for scientific research, those consent forms also stated where their video files would be kept, for how long and that participants' names would remain anonymous.

They were then asked to complete a questionnaire to give more information about their linguistic profiles to provide a clearer and a more accurate idea about their linguistic backgrounds, which was adapted from Gullberg and Indefrey (2003) (see Appendix B). The questionnaire asked about their first language, languages they had learned and how well they spoke them, and parental linguistic backgrounds. In addition, they filled in a language exposure questionnaire (see Appendix C).

After that, participants received a free voucher from Starbucks or Costa as a reward for their participation. They were also offered a debriefing sheet, in which more information of the study was provided.

Then, participants went through two phases (S. Allen et al. 2007). The first phase was the warm-up, in which participants were told how long the experiment would last (about 20 minutes in total), and were given information and instructions regarding the study, with no mention of gestures. They were told to look at every video clip on the computer screen carefully, and that after each clip, they would turn to the listener and describe what happened in the video clip. With two practice videos, they practiced retelling their stories to their

listener. Each video was played only once. A blank page appeared upon its completion. Then, they retold the story to the listener, freely using gestures.

The Listener was a native speaker of the participant's language, so that participants would not over-explain while narrating the story, as they might do if they were speaking to someone who was not a native speaker. Participants were informed that the listener had not seen the videos, so that participants would not under-explain or omit part(s) of the videos' stories, assuming that the listener was already familiar with the videos. Furthermore, the presence of the listener helped to give the situation a more natural, communicative context. However, the listener was passive and did not encourage participants to say or do anything during the retellings of the stories.

During the second, 'testing' phase, participants were shown the 10 Tomato Man video clips and they went followed precisely the same process they used while narrating the practice videos in the warm-up phase (ibid). All narrations were video and audio recorded for later analysis.

Each participant was seated so that to one side there was a table where the computer screen was placed, allowing enough space between the participant and the table so that the participant would feel comfortable while performing manual movements. The experimenter or a research assistant sat away from the screen, using a mouse to move from one slide to another, including the stimulus videos. Had the listener moved the slides, it could seem to the participant that the listener might know the story and consequently the participants might leave essential parts of the story untold. The listener sat on the other side of the participants. A video camera was set right/directly in front of the participant at a distance of about 1.5 meters. Both the participant and the listener were in view of the camera.

After the experiment, subjects were given a debriefing sheet to take home, explaining the real purpose of the experiment. All participants were surprised to learn that the study focused on the gestures accompanying their speech.

3.3.1.5 Speech transcription

All motion event speech was transcribed into ELAN, a software used to create annotations for audio and video ([https://tla.mpi.nl/tools/tla-tools/elan/citing_elan/, 2017](https://tla.mpi.nl/tools/tla-tools/elan/citing_elan/); Sloetjes, and Wittenburg, 2008; Wittenburg, et al., 2006; Brugman , and Russel, 2004; Crasborn, and Sloetjes, 2008; Lausberg, and Sloetjes, 2009). It is also used to annotate gestures. In this study, Arabic speech was transcribed and translated into English by a native Arabic speaker who is also fluent in English, while English was transcribed by the same speaker, then revised by a native English speaker.

3.3.1.6 Speech Coding

3.3.1.6.1 MANNER AND PATH SPEECH CODING

The speech for all participants was segmented into main and subordinate clauses. In every clause, there was only one main verb. English and Arabic participants used a single clause to describe the motion event as in the examples[1] (4a) and (4b). See example (4) below.

Example (4)

a. "The green triangle hops around the tree."

(E4, Jump+Around)

b. "و يقفز حول الشجرة بشكل دائري."

(A3, Jump+Around)

Literal translation:

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[1] All examples throughout the thesis are shown with symbols that indicate the participant's subject group, the participant number and the clip name. For example, (A7, Roll+Up) refers to participant number 7 from the Arabic-speaking group describing the clip Roll+Up.

و[and] يقفز[he jumps] حول[around] الشجرة[the tree] بشكل[in a way] دائري[circular].

English Meaning:

And he jumps around the tree in a circular way.

They also described the motion target event with more than just one clause as in (5a) and (5b). See example (5) below. Clauses used to describe the target event with no reference to manner or path, incomplete clauses, and those which arose due to an experimental glitch have been excluded from the analysis.

Example (5)

a. "The triangle fell off edge, and then, twisted down into the water."

(E7, Tumble+Down)

b. "المثلث نزل للبحر. اتشقلب".

(A8-1, Tumble+Down)

Literal Translation:

المثلث[the triangle] نزل[descended] للبحر[to the sea]. اتشقلب[he tumbled].

English Meaning:

The triangle descended to the sea. He tumbled.

The clauses participants produced in describing motion events were coded into manner clauses, path clauses or conflated clauses. These are discussed in the following paragraphs with illustrative examples.

'Manner' indicates the way an object is moving. In the stimuli of the Tomato Man, it is the movement the object, (namely the 'red circle' or the 'green triangle', is performing while changing its location.

'Path,' however, is the directional component that signifies the change of location of an object, (the red circle or the green triangle in the Tomato Man videos) from one place to another. For example, in the clip of Roll+Up, the manner *roll* indicates the continuous rolling

104

of the Tomato Man on his way up, and the path *up* is in the upward movement of the Tomato Man.

Allen et al., (2007)'s method of coding motion events in speech was followed here. However, grammatical structures of packaging manner and path were not classified into tight, semi-tight or loose as was done by Allen et al. (2007). Instead, every clause that contained elements expressing manner, path or both with respect to the target event was coded as a speech unit. Then, every speech unit was classified into a conflated clause, as a manner clause or as a path clause. Manner clauses and path clauses indicated separation of the syntactic packaging of spatial components.

Conflated clauses

A clause was coded as conflated if it contained both elements; manner and path. It typically included one main verb and a non-verbal phrase closely combined to it. These grammatical features were structurally different in English and Arabic.

The structures of conflated English clauses were similar to the structures of the tight clauses found in S. Allen et al. (2007). Manner and path were expressed by the following grammatical structures. First, they were conveyed by a verb of manner followed by a path satellite or a prepositional phrase conveying direction as in (6a). Second, they were also expressed by a verb of manner followed by further description of the manner, and then by a path satellite or a prepositional phrase conveying direction as in (6b). Third, they were also expressed by a descriptive phrase of the manner followed by a path satellite or a prepositional phrase conveying direction as in (6c). Fourth, manner and path were also conveyed by a verb of manner followed by a path satellite accompanied by more path description as in (6d). See example (6) below.

Examples (6)

a. "It rolled up the hill."

(E4, Roll+Up)

b. "The tomato span around a few times into the sea."

(E2, Rotate+Down)

c. "The red circle, then, did a lovely spin up to the up into the air."

(E8, Spin+Up)

d. "The green triangle jumped in a circle around the tree."

(E3, Jump+Around)

Conflated clauses were also found in Arabic. Manner and path in conflated Arabic clauses were expressed by the following grammatical structures. First, they were expressed by a manner verb followed by either a directional path prepositional phrase or an adverbial phrase as in (7a). Second, they were also expressed by a manner verb followed by a directional path adverbial phrase, followed by further description of the path using a prepositional phrase as in (7b). Third, they were also expressed by a manner verb followed by a directional path prepositional phrase that was followed by a manner adverb which added further description to the manner which was then followed by another directional path prepositional phrase giving further information on the path as in (7c). Fourth, manner and path were also conveyed by a directional path verb followed by a directional path prepositional phrase or adverb of place, thus adding more path description which was followed by a manner prepositional phrase as in (7d). Fifth, they were also expressed by the use of a directional path verb followed by a manner prepositional phrase which was followed by a directional path prepositional phrase thus giving further description of the path as in (7e). Sixth, manner and path were also expressed by a directional path adverb followed by a manner prepositional phrase as in (7f). Seventh, they were also conveyed by a directional

path adverb followed by a manner object phrase, which was followed by further description of the path, using a directional path prepositional phrase as in (7g). Eight, they were also expressed by a directional path object followed by more description of the path using a directional path prepositional phrase followed by a manner prepositional phrase as in (7h). See example (7) below.

Examples (7)

a. "تنط لتحت".

(A2, Jump+Down)

Literal Translation:

تنط[she jumps] لتحت[to down].

English Meaning:

She jumps down

b. "يقفز حول الشجرة بشكل دائري".

(A15, Jump+Around)

Literal Translation:

يقفز[he jumps] حول[around] الشجرة[the tree] بشكل[in a way] دائري[circular].

English Meaning:

He jumps around the tree in a circular way.

c. "المثلث يقفز من أعلى متدرجاً إلى الطماطم".

(A13, Jump+Down)

Literal Translation:

المثلث[the triangle] يقفز[jumps] من[from] أعلى[top] متدرجاً [graduating] إلى[to] الطماطم[the tomato].

English Meaning:

The triangle jumps from top graduating to the tomato.

d. "ثم سقط باتجاه البحر بشكل ملتوي".

(A9, Tumble+Down)

Literal Translation:

ثم[then] سقط[he fell] باتجاه[towards] البحر[the sea] بشكل[in a way] ملتوي[twisted].

English Meaning: Then he fell towards the sea in a twisted way.

e. "المثلث ينزل بشكل حلزوني للطماطة."

(A13, Spin+Down)

Literal Translation:

المثلث[the triangle] ينزل[descends] بشكل[in a way] حلزوني[spiral] للطماطة[to the tomato].

English Meaning:

The triangle descends in a spiral way to the tomato.

f. "المثلث الأخضر اتجه صعوداً بشكل دائري."

(A9, Spin+Up)

Literal Translation:

بشكل[in a way] صعودا[in rise] اتجه[headed] الأخضر[the green] المثلث[the triangle] دائري[circular].

English Meaning:

The triangle the green headed in rise in a circular way.

g. "ثم اتجهت نزولاً بنوع من القفز لدائرة حمراء أخرى."

(A9, Jump+Down)

Literal Translation:

ثم[then] اتجهت[headed she] نزولاً[in descendance] بنوع[in a kind] من[of] القفز[jumping] لدائرة[to a circle] حمراء[red] أخرى[another].

English Meaning:

Then she headed in descendance with a kind of jumping to another red circle.

h. ‏''أخذ المثلث لفة على الشجرة و لكن بقفزات''‎.

(A4, Jump+Around)

Literal Translation:

‏بقفزات‎[by] ‏لكن‎[but] ‏و‎[and] ‏الشجرة‎[the tree] ‏على‎[on] ‏لفة‎[a loop] ‏المثلث‎[the triangle] ‏أخذ‎[took] jumps].

English Meaning:

The triangle took a loop on the tree but by jumps.

Separated clauses

Several participants described the target event in more than just a single clause placing each element of the target event in a separate clause. In this loose packaging of manner and path, participants produced at least one manner clause along with at least one path clause. A clause that contained only a manner component was coded as a manner clause. A clause that contained only a path element was coded as a path clause. If participants produced at least one manner or path clause along with a conflated clause to express the target event, the packaging of the whole target event was considered separated.

Manner clauses

English, manner clauses contained a verb of manner as in (8a), a verb of manner in addition to further description of the manner as in (8b) or manner non-verbal phrases but with no verb of manner as in (8c). These structures were the same as those observed by S. Allen et al. (2007). See example (8) below.

Examples (8)

a. "He revolved."

(E1, Rotate+Down)

b. "Whilst spinning on its own axis."

(E9, Spin+Down)

c. "He did a few circles in the air."

(E12, Rotate+Down)

Clauses coded as manner clauses in Arabic contained a simple manner verb, sometimes followed by an adverbial phrase or a prepositional phrase adding more description to the manner as in (9a) or the verb *walk*, followed by a manner prepositional phrase as in (9b).

Examples (9)

a. ‟الدائرة تدور على نفسها".

(A10, Rotate+Up)

Literal Translation:

الدائرة[the circle] تدور[rotates] على[on] نفسها[herself].

English Meaning:

The circle rotates around itself.

b. ‟المثلث الأخضر مشى بطريقة الدوران".

(A8, Spin+Up)

Literal Translation:

المثلث[the triangle] الأخضر[the green] مشى[walked] بطريقة[in a the way of] الدوران[spinning].

English Meaning:

The triangle walked in the way of spinning.

Path clauses

In English, path clauses were expressed by the verb of path *go*, *come* or *travel* along with a directional path satellite or a prepositional phrase as in (10a), a directional path verb

which was sometimes followed by a directional path satellite or a prepositional phrase as in (10b), or a non-verbal path phrase describing it as in (10c). See example (10) below.

Example (10)

a. "The green triangle went up."

(E9, Spin+Up)

b. "And then, fell into the sea next to the sad triangle."

(E14, Rotate+Down)

c. "He did the loop on the tree."

(E5, Jump+Around)

Path clauses in Arabic were expressed by the directional Path verb that could be followed by further description of the Path using an adverb of place, an adverbial phrase, a prepositional phrase or an object as in (11a), the verb *circle* followed by a directional adverbial phrase or a prepositional phrase as in (11b) or the verb *go* along with an adverb of place, an adverbial phrase or a prepositional phrase as in (11c).

Examples (11)

a. "المثلث نزل للبحر".

(A7, Tumble+Down)

Literal Translation:

المثلث[the triangle] نزل[descended] للبحر[to the sea].

English Meaning:

The triangle descended to the sea.

b. "المثلث يدور حول الشجرة".

(A1, Jump+Around)

Literal Translation:

المثلث[the triangle] يدور[circles] حول[around] الشجرة[the tree].

English Meaning:

The triangle circles around the tree.

c. "المثلث راح للطماطم الثانية".

(A6, Jump+Down)

Literal Translation:

المثلث[the triangle] راح[went] للطماطم[to the tomato] الثانية[the second].

English Meaning:

The triangle went to the second tomato.

3.3.1.6.2 DUAL-NESS SPEECH CODING

All clauses that expressed the idea of two characters involved in performing an action, whether playing the same or different roles, in both languages were coded into dual or non-dual.

Here, dual and non-dual refer to the types of events conveyed, rather than to morphological markers of dual. Note that morphological dual forms were never used in the data set.

Dual events

The concept of dual events were expressed in English by unifying two nouns into one whole subject, or the plural pronoun *they* that could be followed by the conjunction *both,* plus one plural form verb that could be followed by *together* or *with one another* as in (12a). It was also expressed by stating one of the characters as a subject, followed by a singular form verb, which was then followed by the preposition *with,* thus identifying the other character as an object of this preposition, as in (12b). See example (12) below.

Example (12)

a. "A red tomato and a green triangle came in at the bottom of the hill."

(E9, Spin+Up)

b. "He went off the screen with the tomato."

(E10, Jump+Around)

   This idea of dual events was also expressed in Arabic. It was conveyed through identifying the two characters as one unified subject that was preceded or followed by a plural form verb which could be followed by *together* or *with one another* as in (13a). It was also expressed by making one of the characters as the subject, preceded or followed by a singular form verb, which was then followed by the conjunction *with* plus the second character as in (13b). See example (13) below.

Example (13)

a. "واجه المثلث و الطماطم طلعة."

(A31-1, Spin+Up)

Literal Translation:

واجه[faced] المثلث[the triangle] و[and] الطماطم[the tomato] طلعة[a hill].

English Meaning:

The tomato and the triangle faced a hill.

b. "و راحت الدائرة معاه."

(A42-1, Jump+Up)

Literal Translation:

و[and] راحت[went] الدائرة[the] معاه[with him].

English Meaning

And the circle went with him.

Non-dual events

Non-dual events were expressed in English by a subject as one of the characters performing an action upon the other character as the object of the verb as in (14a), or the object in a prepositional phrase as in (14b). See example (14) below.

Example (14)

a. "The triangle hit the tomato."

(E13, Roll+Up)

b. "He went in front of the circle tomato."

(E7, Jump+Up)

Such non-dual events were also found in Arabic. They were conveyed by using one of the two characters as the subject and the other character as the object of the verb as in (15a), or included in an adverbial phrase or a prepositional phrase as in (15b).

Example (15)

a. ‟المثلث الأخضر دف الدائرة الحمرا".

(A3, Roll+Up)

Literal Translation:

المثلث[the triangle] الأخضر[the green] دف[pushed] الدائرة[the circle] الحمرا[the red].

English Meaning:

The green triangle pushed the red circle.

b. ‟مر من أمام الطماطم".

(A4, Jump+Up)

Literal Translation:

مر[passes he] من[from] أمام[in front] الطماطم[the tomato].

English Meaning:

He passed in front of the tomato.

3.3.1.7 Gesture coding

All manual gestures that were used with the clauses the participants produced while describing the target event that included manner, path or both were transcribed. The transcription specifically only included the stroke phase of these gestures (Kendon, 1980; McNeill, 1992) because that is the meaningful part of the of the gesture. Gestures were annotated using the software ELAN (http://tla.mpi.nl/tools/tla-tools/elan/, 2017).

3.3.1.7.1 MANNER AND PATH GESTURE CODING

Gestures expressing manner and path were coded, according to the coding manual used for coding manner and path gestures in previous studies, which used Tomato Man stimuli such as Allen et al., (2007) and Kita, and Özyürek, (2003). Gestures expressing manner, path or both that were produced while describing the motion events were coded into one of six categories; manner, path, conflated, manner + conflated, path + conflated and unclear.

A manner gesture indicated how the movement was done with no encoding of the path such as forming a full circle shape to represent the rotational motion of the object. A path gesture conveyed change of location but gave no indication of manner. In path gestures, the hands seemed like it was tracing the path from a certain point to another such as moving the hand downward to represent the downward movement of the object. A conflated gesture conflated both the manner and the path of motion into a whole single gesture as in moving the hand from a certain point downward with repeated up and down motion representing a jumping down movement.

A manner + conflated gesture expressed both a manner movement and a conflated one within a whole single gesture such as making two or three full circles at a certain point, then moving downwards while drawing circles on the way without stopping between the manner part and the Conflated part to represent the rotating downward motion event. A path +

115

conflated gesture encoded a path movement along with a conflated one within a whole single gesture as in moving the hand upward forming little circles all along till a certain point where the hand continued moving upward in a straight line without stopping in the middle to represent an upward spinning motion.

The unclear categorization was used for gestures that were difficult to segment or to classify as one of the previously mentioned categories. It was also used for gestures that were not clear in terms of being representational or interactive (Bavelas, J. B., Chovil, N., Lawrie, D., A., & Wade, A. 1992). These gestures were excluded from the analysis.

3.3.1.7.2 DUAL GESTURE CODING

All representational gestures accompanying dual and non-dual clauses were transcribed. Representational gestures were more likely to encode the concept of dual. Interactive gestures were not transcribed because they do not encode the concept of dual-ness. Coding dual-ness and non-dualness in gestures depended on three factors; hands shape, the number of character being referred to, and the if they are performing the exact roles or different ones.

Coding dual-ness in gestures depended on the hand shape used to perform the gesture as well as the number of characters playing the exact role of an action it indicated. Representational gestures were considered dual if they belonged to one of the following categories; one hand with two extended fingers referring to two characters playing the exact roles, two hands each with one extended finger referring to two characters playing the exact roles or two hands each with two extended fingers referring to two characters playing the exact roles.

They were considered non-dual if they were classified as one of the following categories; one hand with one extended finger referring to one character, one hand with one extended finger referring to two characters, one hands with two extended fingers referring to

one character, one whole hand referring to one character, one whole hand referring to two characters, two hands each with one extended finger referring to one character, two hands with two extended fingers referring to one character or two whole hands referring to one character, or two hands referring to two characters playing different roles.

Other hand shapes were fitted into these categories wherever possible. For example, if a participant used a three-finger hand shape, it would be coded as a whole hand. The accompanying speech was used to interpret whether the gesture indicated one or two characters. If there were gestures that were not clear enough to be coded, regarding dual-ness because of their hand shape or the number of characters they indicated, these gestures were coded as 'other', and then excluded from the analysis.

3.3.1.7.3 GESTURE SPACE CODING

All representational gestures were coded with regard to their space. I followed McNeill's (1992) model in which the whole gesture space around the body was divided into smaller square areas by using a concentric-square system (see Figure 3). This model has also been used for the same purpose in previous gesture studies such as (Cavicchio and Kita 2013).
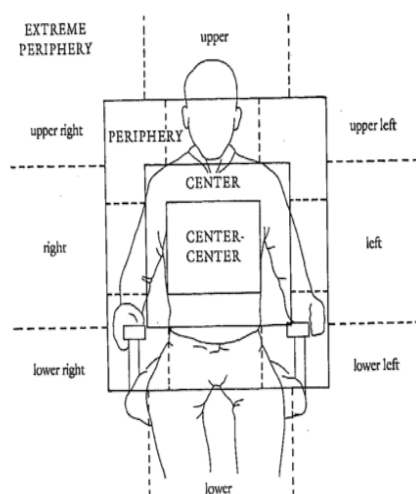
Figure 3: (McNeill 1992:89)'s model used to measure gesture space

Gestures were coded according to in which square of the above diagram they were performed. They were coded into Centre Centre, Centre, Peripheral and Extreme Peripheral. One problem of using McNeill's (1992) scheme for our current purpose is that if the hand performed a gesture while it was in the resting position (for example around the knee area), categorizing this gesture as an Extreme Peripheral would mean interpreting it as a very large gesture. To avoid this problem, I added the Resting Position as an additional category. Gestures produced in the Extreme Peripheral area used considerably more space than gestures produced in the other areas, whereas the least space was used for those produced in the Centre Centre area.

3.3.1.7.4 GESTURE RATE CODING

The strokes of the gestures produced were coded. Then, gesture rate was calculated by counting the number of representational gestures produced per 100 words.

3.3 Results

3.3.1 Manner and path results

Manner and path speech

The purpose here is to investigate whether gestural expressions of the same events vary with different syntactic structures between the two languages; Arabic and English, and how. Speech was examined first. The focus was only on clauses the participants produced while describing the targets events that encoded both elements (manner and path) whether in conflation or separation. Arabic and English were compared in terms of the percentage of conflation in the syntactic packaging of manner and path.

The focus here was on descriptions of events in which both manner and path were linguistically expressed, so manner clauses and path clauses were excluded from the analysis. Then, an independent t-test was applied to compare the percentage of conflated (tight) clauses across the two languages. The percentage of conflated clauses was higher in English (N = 15) than in Arabic (N = 14), (as Levene's test shows significant difference in variances between two groups, we used t-test that does not assume equal variances, t (21.98) = -2.510 , p = .020) (see Figure 4). The analysis of speech shows that when participants expressed both elements (manner and path) in their descriptions, English and Arabic participants used different syntactic packaging (see Figure 4).
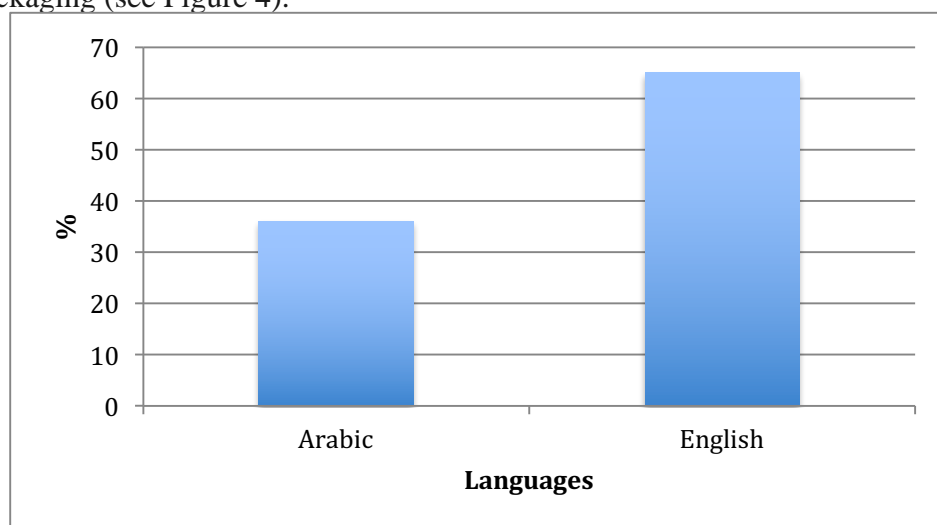
Figure 4: Percentage of conflation in speech in English and Arabic

Manner and path gesture

The main investigation here was to find out whether the variations in syntactic packaging of information in speech influenced information packaging in gestures when both components were produced throughout the description of the target events. Therefore, event descriptions that included only manner or only path were excluded from the analysis.

Then, the percentage of conflated gestures (among all gestures that expressed manner and path) were calculated and compared across the two languages. The proportion of conflated gestures in English (N = 13) was significantly higher than in Arabic (N = 14), (as Levene's test demonstrates significant difference in variances between two groups, I used a t-test that does not assume equal variances, t (24.901) = -2.717, p = .012) (see Figure 5).

The analysis indicates that gestural packaging of manner and path is affected by the syntactic packaging of manner and path that is typically used in the two languages; English and Arabic.
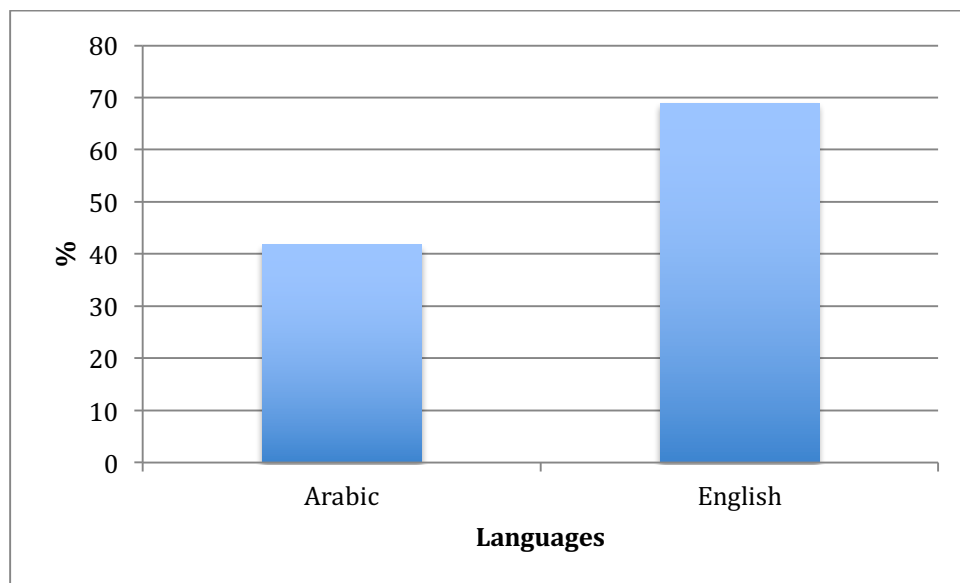
Figure 5: Percentage of conflated gestures in English and Arabic

To examine this result qualitatively, studying example (16) below can show the difference between the ways in which English and Arabic participants package spatial information in speech and gesture. Both participants here were describing the clip Tumble+Down.

Example (16)

a. "The triangle span down."

(E4, Tumble+Down).

b. ‟المثلث تشقلب. و طاح في البحر."

(A6, Tumble+Down)

Literal Translation:

المثلث[the triangle] تشقلب[tumbled]. و[and] طاح[fell] في[in] البحر[the sea].

English Meaning:

The triangle tumbled. And fell in the sea.

In this example, both the English as well as the Arabic participants expressed the two elements (manner and path) verbally. However, the syntactic packaging they used to do so was different. The English participant (16a), on the one hand, expressed both elements, manner and path, in a single conflated clause using a verb that encoded manner followed by directional path particle. Such syntactic packaging of manner and path information was typically used by English participants in this study.

By contrast, the Arabic participant (16b) expressed the target event in this example in two loose clauses. In the first clause, he expressed manner through a manner verb. In the other clause, he expressed path by using a directional path verb in addition to a directional prepositional phrase adding more details of the path. Such syntactic packaging of the manner and path was typically used by Arabic participants in speech in this study.

In terms of gesture, the English participant (16a) accompanied the clause 'span down'

with one gesture that conflated both components manner and path. In this gesture, his left hand moved downwards making a circle as it moved down (see Figure 6). Such gestural packaging of manner and path was typically performed by English participants in this study.

Figure 6: The conflated gesture the speaker E4 produced while expressing the manner 'span' and the path 'down'

However, the Arabic participant's (16b) speech was accompanied by two separate gestures, each representing one component only. As he said 'tumbled', he started making two circles in the same place with both of his indexes. Then just before he said 'and fell in the sea', he made another gesture that encoded Path. He moved his left index finger downwards (see Figure 7 and Figure 8). Such usage of separate gestures to package manner and path information was typically done by Arabic participants in this research.
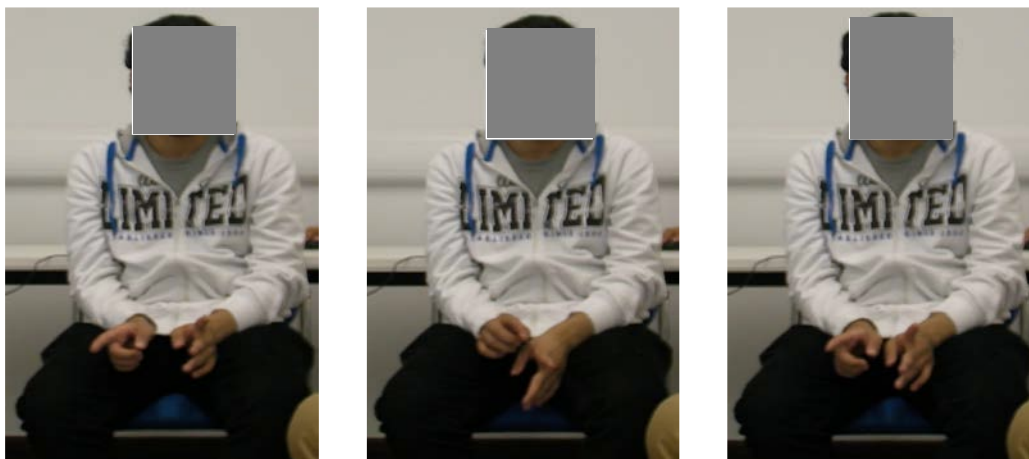
Figure 7: The manner gesture A6 performed while expressing manner in the clause 'tumbled'

Figure 8: The path gesture A6 performed while expressing path in the clause 'fell in the sea'

3.3.2 Dual gestures results

First, with regard to expressing dual-ness in speech, all the Arabic speakers expressed the concept of dual-ness (two characters performing an action) by using the plural form. None of them used dual pronouns or dual morphological suffixes that are used in Standard Arabic to express that. This is because none of the Arabic speakers spoke Standard Arabic. They all spoke in their everyday Arabic, which does not use grammatical marking of dual. All the English speakers used the plural form to express the concept of dual-ness.

Second, with regard to dual gestures, the results are as follows. The focus of the analysis was on gestures that accompany utterances that describe two-character events. The two character events were further divided into dual event clauses (events that would be described with dual morphology in Standard Arabic; e.g., "The two characters left the scene with one another) and non-dual event clauses (e.g., "The triangle pushed the tomato"). The average percentage of dual event clauses (among all two-character event clauses) was 30 % for Arabic speakers and 30 % for English speakers. The average of non-dual event clauses (among all two-character clauses) was 3 % in Arabic and 3.6 % in English.

The percentage of dual gestures was calculated among all representational gestures depicting character's motion. The percentage of these gestures was significantly higher in

Arabic (N = 14) than in English (N=13), (as Levene's test shows significant difference in variances between two groups, we used the t-test that does not assume equal variances, t (14.852) = 2.634, p = .020) (see Figure 9).
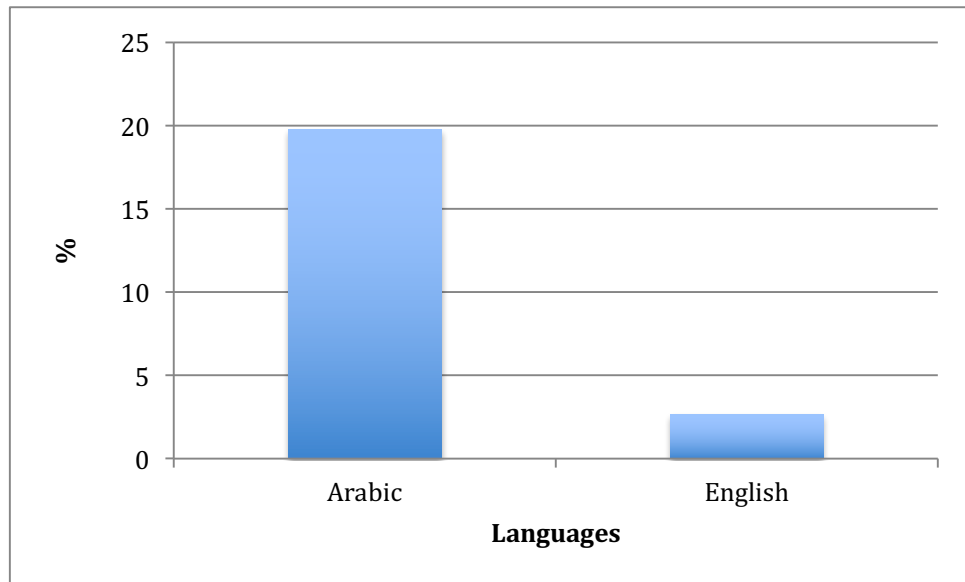
Figure 9: Percentage of dual gestures in English and Arabic

Example (13) shows the cross-cultural difference concerning dual gestures between English and Arabic. It illustrates the key finding: the English speaker used fewer dual gestures than the Arabic speaker. In both examples, the participants described the exact dual event, which was the entry event of the clip Jump+Around.

Examples (13)

a. "The tomato and the triangle both came in together."

(E1, Jump+Around).

b. "جو الدائرة و المثلث".

(A11, Jump+Around).

Literal Translation:

المثلث [the triangle] و[and] الدائرة[the circle] جو[came].

English Meaning:

124

The triangle and the tomato came.

The English participant (13a) expressed the idea of dual-ness in the above clause. He described the action of the two characters entering the scene together. He performed a gesture to represent that action. Towards the end of uttering the word 'both', he started making a gesture using his whole left hand in the resting position area (his lap area). His gesture continued to accompany the verb 'came'. His whole hand moved away from his body but was still in the resting position. The gesture represented the dual event of the entering the scene of the two characters together. He used a single whole hand to perform it even though the referent action was performed by two characters; The Tomato and the Triangle. Therefore, this gesture is considered to be non-dual (see Figure 10).

Figure 3: the non-dual gesture A30 performed while expressing dual event of the entering of the two characters together

In example (13b), the Arabic participant described the dual event of the arrival of the Green Triangle and the Red Tomato together into the scene by the dual event clause in example (13b) above. He started to perform a gesture as he started to say the verb 'came'. In this gesture, he used his left hand with only the index and the middle fingers extended, representing the two characters involved in performing the action of coming, namely The Triangle and The Tomato. He moved his hand in this shape in front of his upper chest outwards in a path gesture representing the action of the two characters coming together. His

gesture expressed the concept of dual-ness (see Figure 11).

Figure 11: The dual gesture A11 pefromed while expressing dual event of the the coming of the two characters together

In order to investigate whether the production of dual gestures was modulated by the type of event being dual or non-dual, we conducted a 2x2 ANOVA. The Percentage of dual gestures was entered into 2x2 ANOVA with event type (dual vs. non-dual) and language (English vs. Arabic) as independent variables. 8 English speakers and 11 Arabic speakers who produced motion-depicting representational gestures in both dual events and non-dual events were included in the analysis. The main effect of event type was significant, $F (1, 17) = 3.972$, $p = .036$. The percentage of dual gestures was higher in dual events than in non-dual events. The main effect of language was significant, $F (1, 17) = 4.940$, $p = .040$. The percentage of dual gestures was higher for Arabic speakers than English speakers. The interaction between event type and language was not significant, $F (1, 17), = 0.024$ (see Figure 12 and Figure 13). Thus, event type did not modulate the cross-linguistic difference in the percentage of dual gestures. Arabic speakers were more likely to produce dual gestures when describing events with two characters, regardless of whether Standard Arabic would use morphological dual forms to describe the events.
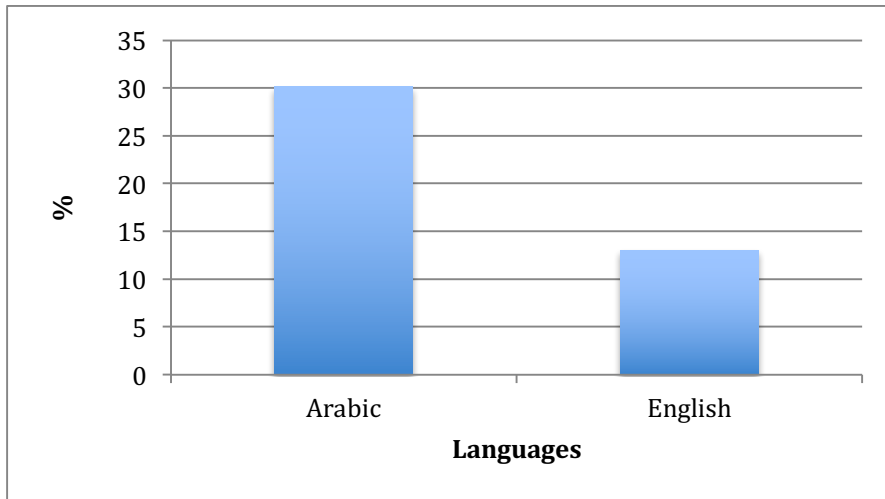
Figure 12: Percentage of dual events in English and Arabic
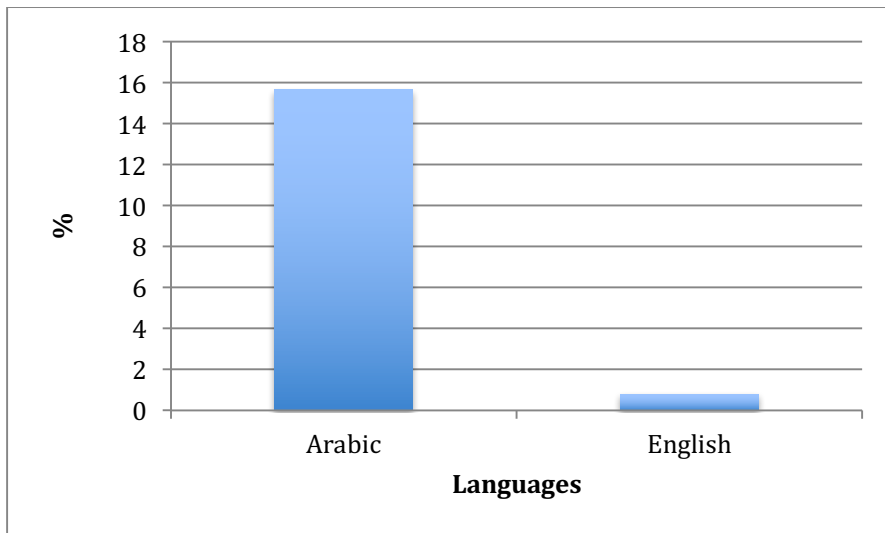
Figure 13: Percentage of non-dual events in English and Arabic

3.3.3 Gesture space results

The percentage of representational gestures produced in the Extreme Peripheral area to the body was calculated among all the gestures that depicted the motion of the characters. The percentage of Extreme Peripheral gestures was significantly higher in Arabic (N = 14) than in English (N=13), (as Levene's test shows significant difference in variances between two groups, we used the t-test that does not assume equal variances, t (18.538) = 2.350, p = .030) (see Figure 14).
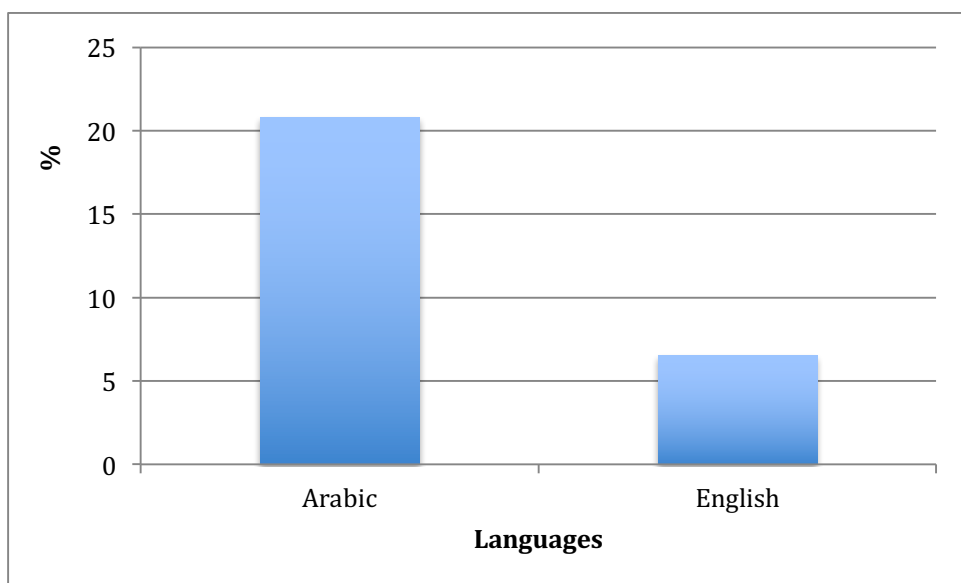
Figure 14: Percentage of Extreme Peripheral gestures in English and Arabic

Example (14) shows the different usage of gesture space between English and Arabic. It illustrates the key finding: the English speaker used less gesture space than the Arabic speaker.

Example (14)

a. "The tomato fell into the sea."

(E13, Roll+Up).

b. "و طاحت في البحر".

(A8, Roll+Up).

Literal Translation:

و[and] طاحت[fell she] في[in] البحر[the sea].

English Meaning:

And she fell into the sea.

In this example, both the English participant (14a) and the Arabic participant (14b) expressed the same idea in speech which was the tomato falling into the sea. However, the space they used to perform the accompanying gesture of this clause was different.

As the English participant (14a) uttered the word 'sea', she started making a path gesture to represent the falling of the tomato into the sea. She started moving her right hand from in front of the top of her right shoulder, i.e. the end of the Centre area to the body, outward and to the right. Then she stopped moving her hand at the end of the stroke of the gesture where the Peripheral area begins (see Figure 15).

Figure 15: The peripheral gesture E13 performed while expressing the falling of the tomato into the sea

The Arabic participant (14b) also made a path gesture that encoded the falling of the tomato into the sea. However, she used a larger space around her body to perform the gesture. She started the stroke of her gesture with her right hand from the Extreme Peripheral. Specifically, she started moving her hand from a point parallel to the highest point in her forehead downward and to the right. She ended the gesture above her right shoulder in the Peripheral area (see Figure 16).

Figure 16: The extreme peripheral representational gesture A8 performed while expressing the falling of the tomato into the sea

3.3.4 Gesture rate

The goal of the analysis is to highlight the feature of gesture rate in English and in Arabic. This analysis investigated the rate of representational gestures produced by speakers of English and Arabic during their descriptions of the motion events in their languages. Only representational gestures were included in the analysis. A t-test was applied in order to calculate the percentage of representational gestures per 100 words in English and Arabic. The rate of representational gestures in Arabic (N = 14) was significantly higher than in English (N = 14), (as Levene's test shows significant difference in variances between two groups, we used t-test that does not assume equal variances, t (23.120) = 8.632, p = .000) (see Figure 17).
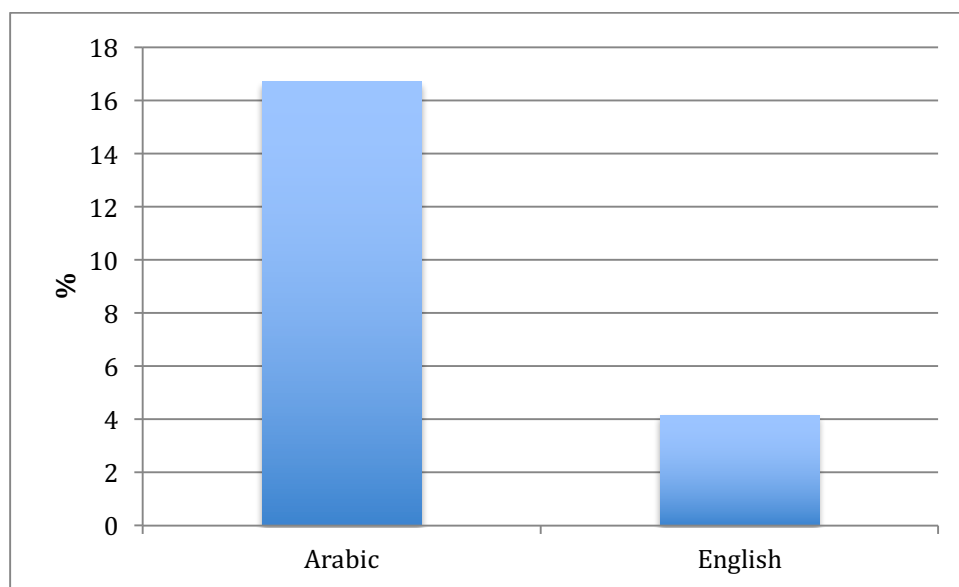

Figure 17: Rate of representational gestures (Number of representational gestures per 100 words) in English and in Arabic

Example (15) shows the cross-cultural difference between English and Arabic in regard to gesture rate. It illustrates the key finding: the English speakers produced a lower rate of gestures than the Arabic speaker.

130

Example (15)

a. "The unhappy green triangle hops up the hill."

(E11, Jump+Up).

b. ''المثلث الأخضر كان متجه صعوداً إلى الدويرة الحمرا بنوع من القفز''.

(A9, Jump+Up).

Literal Translation:

المثلث[the triangle] الأخضر[the green] كان[was] متجه[heading] صعوداً[in rise] إلى[to] الدويرة[the circle] الحمرا[the red] بنوع[in a kind] من[of] القفز[jumping].

English Meaning:

The green triangle was heading in rise to the red circle in a kind of jumping.

In examining a sample from the data, the difference between the rate of representational gestures produced by English participants and those produced by Arabic participants can be observed. In the above example, although the English (15a) and the Arabic (15b) participants conveyed the same idea, namely the green triangle jumping up the hill, the gesture rate for each one was different. The English participant (15a) produced a clause that consisted of eight words. Throughout that clause, he did not make any gestures. He kept both of his hands in the resting position, which was the left side of his lap area, without moving during this period (see Figure 18).

Figure 18: E11 did not produce any gesture while expressing the jumping up of the triangle in eight words

However, the Arabic participant (15b) produced four gestures during a clause comprised of eleven words. He started with an upward path gesture using his left hand that accompanied the Arabic word 'صعوداً' meaning 'rise'. Then, he performed two pointing gestures with his left index finger; one gesture accompanied the word 'الدويرة' meaning the circle, and the other one accompanied the word 'الحمرا' meaning the red. After that, he performed a gesture with his right index finger accompanying the last phrase of the clause. It encoded an upward movement along with a series of little jumps (see Figure 19, Figure 20, Figure 21 and Figure 22).

Figure 19: The first representational gesture A9 produced accompanying the word 'rise' while expressing the jumping up of the triangle in eleven words

Figure 20: The second representational gesture A9 produced accompanying the word 'the circle' while expressing the jumping up of the triangle in eleven words

Figure 21: The third representational gesture A9 produced accompanying the word 'the red' while expressing the jumping up of the triangle in eleven words

Figure 22: The fourth representational gesture A9 produced accompanying the phrase 'in a way of jumping' while expressing the jumping up of the triangle in eleven words

3.4 Discussion:

This study investigated cross-cultural differences in gesture between English and Arabic speakers in terms of four features. These features are packaging of manner and path, dual-ness, use of gesture space and gesture rate.

3.4.1 Language effect

3.4.1.1 Packaging of manner and path

One of the factors that have been observed to shape gestures is Slobin's (1987, 1996) thinking for speaking (Kita, and Özyürek, 2003). In order to investigate this, it was important to first establish how Arabic speech expressed manner and path in spontaneous event descriptions, acknowledging the controversy as to whether Arabic is a verb-framed language (Almurshidi, 2013) or is not (Saidi, 2007). This study provided evidence that Arabic is, indeed, a verb-framed language and reflects Talmy's (1985, 2007) typology. It was found that the Arabic speaker group produced more clauses in which they separated manner and path in speech. This means that they predominantly used verb-framed language patterns in the descriptions of motion events. This study provided quantitative data which the literature of Arabic language typology lacks.

With regard to gesture, English speakers were more likely to produce more conflated gestures to express manner and path in comparison to Arabic speakers. That is, gestures tended to express manner and path together in a single movement when manner and path were expressed in a single clause. Given that clauses are units for speech production planning (Kita et al., 2007), this indicates that when speakers conceptually plan manner and path together, within a single processing cycle, as in English, they express manner and path in a single gesture. However, when manner and path are planned in two separate planning

cycles, then the information is separated into two gestures. This indicates that cross-linguistic difference in thinking for speaking is reflected in gestures.

This finding is consistent with what has been found by Özyürek and Kita (1999) as well as Kita and Özyürek (2003), in which English speakers conveyed manner and path using more conflated gestures than Japanese and Turkish speakers. Arabic speakers, on the other hand, typically expressed manner and path in separate gestures similar to Japanese and Turkish speakers in Özyürek and Kita (1999) and Kita and Özyürek (2003). That is, English and Arabic speakers' gestures reflected their own language's typical way of syntactically packaging manner and path.

According to the data in this study, how verb-framed is Arabic? In other words, where is Arabic located on the language typology continuum? Does Arabic use other ways of expressing motion than its own typology?

An important contribution to the language typology literature here is that the verb-framed and satellite-framed binary distinction suggested by Talmy (1991, 2007) is not reflected in this study. With regard to Arabic, the Arabic speakers produced about 64 % of the clauses in which they separated manner and path while describing motion. Thus, they predominantly use the verb-framed style to express motion. This percentage reflects the Arabic language typology in Talmy (1991, 2007). However, these speakers also produced about 36 % of clauses in which they conflated manner and path while describing motion. This is a satellite-framed style, indicating that Arabic speakers also used ways for expressing motion that are not typical to their language type. The conflated manner and path in about a third of the clauses they produced to express motion. This indicates that the binary of verb-framed vs. satellite-framed languages distinction is not restrictive with regard to Arabic.

Arabic in this study seems to be similar to Italian in Talmy (1991) and Wessel-Tolvig, Bjørn, and Patrizia Paggio (2017). Both Arabic and Italians are verb-framed languages, as

proposed by Talmy (1991, 2007). However, speakers of these languages sometimes do use ways to express motion that are not typical of their language type. Both languages sometimes do use satellite-framed ways for expressing motion. Neither are pure verb-framed languages. On the language typology continuum, they are not placed on the verb-framed language end, but rather perhaps on a point between the middle of the continuum and the verb-framed languages end.

The results here are not fully consistent with the findings of Almurshidi (2013). The quantitative and qualitative data findings of Arabic speakers in this study shows that spoken Arabic uses both verb-framed as well as satellite-framed styles in expressing motion, but with different percentages. They do, however, predominantly use the verb-framed style.

With regard to English, the speakers also used both styles in expressing motion (satellite-framed and verb-framed). However, in about 65% of the clauses they produced to express motion, they used satellite-framed ways in which they conflated manner and path. In 35% of the clauses they produced to express motion, they used a verb-framed style, which is not typical to their language type in which they typically separated manner and path. Thus, English is a satellite-framed language because it predominantly uses satellite-framed language ways for expressing motion, and not because it only uses that style.

Thus, it seems that both the Arabic and the English speakers use the style typical to their language in about two thirds of the data. They use the other style in approximately a third of the data. This difference in percentage might become a topic for future investigation.

3.4.1.2 Dual gestures

Dual gestures represent another example of the influence of language on shaping gestures. This was demonstrated in this study. When describing events involving two characters, the Arabic speakers produced more dual gestures, iconically representing "two-

136

ness" with two fingers or two hands, than did the English speakers. This is unlikely to be a thinking-for-speaking effect because Arabic speakers did not use dual morphology in their speech. It is concluded that gestures indeed reveal language-specific habitual thoughts, which are shaped by Standard Arabic speech.

It is interesting that Arabic speakers produced more dual gestures for both dual events and non-dual events. This suggests that Arabic speakers' habitual thoughts were shaped by Standard Arabic. Because Arabic speakers are frequently exposed to Standard Arabic, the concept of two-ness becomes important initially when thinking about dual events, but subsequently more generally when thinking about all types of events involving two participants (including non-dual events). That is, two-ness is habitually highlighted in Arabic speakers' minds when thinking about events with two participants. This may have originated from the sense of equality of the dual grammatical category. The exposure to Standard Arabic might have created this notion among Arabic speakers that equal attention should be paid to participants of an action, which can be seen from their gestures. In this sense, the result is in line with the Whorfian hypothesis of language shaping habitual thinking, which in turn shapes gesture.

This finding provides additional evidence to Majid's et al. (2004) study for the idea that language-specific habitual thought can shape gesture. In their study, they argued that gestures referring to an absolute frame of reference among Australian Aboriginal people reflected habitual thought that was shaped by language (Majid et al. 2004).

In the case of Arabic speakers' use of dual gestures, it is difficult to think of alternative explanations based on ecological or other cultural factors. Although there are many ecological and cultural differences between the Arabic and English speakers in this study, such as the writing direction (right to left vs. left to right), the weather (hot and dry vs. cold and wet), the mechanism of how such factors might stimulate dual gestures to arise in

Saudi Arabia is not clear. Therefore, we argue here that Standard Arabic is the reason behind the Arabic speakers' use of dual gestures as it has the dual grammatical form.

3.4.2 Ecological backgrounds

Another factor that might have had an impact on shaping gestures was the ecological and historical background. This factor might have created differences between English and Arabic gestures in terms of space and rate.

3.4.2.1 Gesture space

Another difference between the two cultures (English and Arabic) relates to the use of gesture space. In this study, it was found that the English speakers used less space in performing gestures than the Arabic speakers. This shows that the English speakers are similar in terms of this gesture feature to other speakers from Northern European cultural backgrounds like the German speakers in Müller's (1998) study. By contrast, the same study shows that the Arabic speakers' gestures are prominent and expansive. Arabic speakers' use of gesture space is similar to what has been learned about Italian speakers in Efron's (1941, 1972) studies and Spanish speakers in Müller's (1998) study.

3.4.2.2 Gesture rate

Gesture rate, also, differs across the two cultures. It was found that the English speakers produced lower rate of representational gestures than Arabic speakers. This finding is compatible with Graham and Argyle (1975)'s claim that British English is considered low in terms of gesture frequency. The Arabic speakers' gesture rate, on the other hand, is similar to Italian speakers' gesture rate in Barzini's (1964) study and Kendon's (1992, 1995) studies.

The finding of gesture space and gesture rate of Arabic speakers is in line with the hypothesis that Middle Eastern speakers may have similar gesture features with speakers from Mediterranean cultures. It is suggested that this might be an effect of being exposed to a

similar ecology based on (Efron, 1972; Murphy, 1942; De Jorio, and Kendon, 2000; and Kendon, 2004) in which communication occurs, and also to previous cultural interaction based on (Efron, 1942, 1972; and Morris, 1979). Accordingly, the similarities between the ecological features surrounding Italian speakers and those surrounding Arabic speakers that have been discussed earlier in section (3.1.2) might have played a role in creating similarities in the use of gesture space and gesture rate.

Possible effect of L2 knowledge

Although this study is a comparison between L1 Arabic and L1 English, Arabic speakers here are not purely monolingual. They are learners of L2 English. They are enrolled as beginners in English learning institutions. They have been in the United Kingdom for not more than three months.

Previous literature has shown that knowledge of L2 may influence L1 gestures (Brown and Gullberg, 2008; Wing Chee So, 2010) (see section 2.4.6). Would Arabic gesture features of the Arabic speakers in this study have been affected by their knowledge of English? This is discussed further in relation to the results in the following paragraphs.

One of the key findings in this study is with regard to the difference in the number of conflated gestures produced during describing motion events. Arabic speakers produced significantly fewer conflated gestures than English speakers. This difference was expected to occur because Arabic is said to be a verb-framed language while English is a satellite-framed language. Based on previous studies Brown and Gullberg (2008) and Wing Chee So (2010), gestures of the Arabic speakers in this study might have been influenced by their limited knowledge of English. That is, they may have started establishing monolingual English patterns by conceptualizing motion events. This would have affected their speech and gesture. If their speech and gesture are compared to those of pure monolingual Arabic speakers, perhaps they would have been shown to produce more conflated clauses in speech

and accordingly more conflated gestures, than those of pure monolingual Arabic speakers. This means that their knowledge of a satellite-framed language might have affected the purity of their L1 verb-framed language. It is expected that if Arabic speakers were completely monolingual, the distinction between Arabic and English speakers might have been sharper. However, the key point is that the study found, despite the Arabic speakers' knowledge of English, a significant gestural difference between Arabic and English that were theoretically predicted.

Arabic speakers' knowledge of L2 might have also affected their use of gesture space. As has been discussed earlier, Arabic speakers used significantly larger gesture space than English speakers. It seems that the use of large gestures is an Arabic gesture feature. It is, therefore, possible that monolingual Arabic speakers would use even larger space for their gestures than the space used by the Arabic learners of English in this study. However, the difference might not be very large for two reasons. First, Arabic speakers in this study are at their early stages of learning L2 English. So, the effect of their L2 knowledge would not have much influence on their use of gesture space. Second, there is not much room left for even larger gestures, and that the largest space an Arabic speaker can use for a gesture is approximately the same as the gesture space used by the Arabic speakers in this study.

The gesture rate of the Arabic speakers in this study might have also been influenced by their knowledge of the lower-gesture-frequency language; English. It has been seen that the Arabic speakers here produced a higher gesture rate than the English speakers. This suggested that Arabic is a high-gesture-frequency language. It is assumed that if the Arabic speakers were monolingual, they would have produced an even higher gesture rate based on Wing Chee So (2010): a low-gesture-frequency L2 (English) can lower the gesture rate for a high-gesture-frequency L1 (Arabic).

3.5 Conclusion

Thus, this study spotlighted cross-cultural variations in gesture features between English and Arabic. In this comparison, it was found that the English speakers produced more conflated gestures to express manner and path than the Arabic speakers. It was also found that the English speakers produced fewer dual gestures to express the concept of dual-ness than the Arabic speakers. I addition, it was found that the English speakers used less gesture space to perform representational gestures than the space used by the Arabic speakers. Furthermore, it was found that the English speakers produced lower rate of representational gestures than the Arabic speakers. Besides gesture features in English and Arabic speakers, this study also accentuated how language and culture can shape gestures.

Chapter Four: Factors Influencing Features of Gesture of Arabic Learners of English

4.1 Introduction

This study explores features of co-speech gestures produced by Arabic learners of English. This exploration will be carried out using a comparison between their first language (L1), which is Arabic, and their (L2), which is English, in terms of four features, namely spatial components packaging, dual gestures, gesture space and gesture rate. These features have been shown to be shaped by various factors such as language and communicative demands. They are discussed in detail in the following section.

4.1.1 Cross-linguistic transfer of gesture properties

Gestures of learners of a second language can be shaped by cross-linguistic influence. That is, their gesture features can reveal an influence of both their first and their second languages.

4.1.1.1 The effect of L2 culture on L2 gesture

The L2 culture can shape the features of gestures in L2 learners. That is, L2 learners can acquire some of the gesture features of the language they are learning as a result of being assimilated in an L2 culture.

The acquisition of target-like gestures was investigated in a study by McCafferty and Ahmed (2000). They examined how two groups of Japanese advanced learners of English obtained metaphoric as well as abstract gestures representing abstract ideas of the target language. The first group comprised of learners of English who were absorbed in the American culture. The second group was also learners of English who was not grounded in

the L2 culture. Their metaphoric gestures and other gestures representing abstract concepts produced during their L2 speech about marriage were examined and compared. It was found that the assimilated group acquired more target-like abstract gestures. It is concluded that being absorbed in an L2 culture enables learners to acquire abstract gestures that are target-like. This study is relevant here because it shows how the target language can influence L2 learners' gestures. In other words, the properties of gestures that are specific to the target language can transfer into their L2 gestures. Their gestures acquire features of the target language gesture.

4.1.1.2 First Language effect on L2 gesture

Features of L2 learners' gestures can be influenced by the properties of their gestural repertoire in their L1. That is, some features of their gestures produced while speaking L2 may resemble features of their gestures while speaking their L1.

As mentioned earlier in sections 2.4.4. & 3.1.1.1, speakers of typologically different languages follow different patterns of thinking for speaking (Slobin, 1996). Speakers of verb-framed languages such as Turkish and Japanese tend to express manner and path separately in gesture. By contrast, in speakers of satellite-framed languages such as English, in which manner and path are simultaneously conveyed, these spatial components are more likely to be conflated in gesture (Talmy, 1985).

But how do L2 learners express motion events gesturally when they are learning a typologically different language? It has been observed that while speaking L2, which is typologically different than L1, learners' gestures bear the influence of their L1 as well as their L2 typology (Yoshioka, and Kellerman, 2006; Negueruela, Lantolf, Jordan, and Gelabert, 2004). This is discussed further in the following sections.

Gestural expression of motion events in L2 learners may be influenced by the way these events are expressed in their first language. This means that if their first language is

verb-framed, and they are learning a satellite-framed language, they might follow the typology of their L1 in their use of gesture.

Expressions of the ground element was examined in Dutch speakers who are low intermediate learners of Japanese in a study by Yoshioka and Kellerman (2006), previously mentioned in section 2.5.2.2. These two languages are typologically different. According to Talmy (1991), Dutch is a satellite-framed language, while Japanese is a verb-framed language. According to Slobin (1996), these two types of languages handle the ground element differently when expressing motion events. Dutch speakers pay more attention to the dynamics of the movement in a motion event. In contrast, Japanese speakers pay more attention to the ground element. Further explanation on the ground element and how different types of languages deal with it was explained in detail in Chapter Two in section 2.5.2.2**.** It was found that L2 learners followed their L1 typology in handling the ground element in speech and gesture while speaking their L2. Thus, they maintained a gesture feature of their first language during their L2 speech (Yoshioka, and Kellerman, 2006).

The influence of L1 on L2 gesture can also been seen in expressions of manner of motion. Brown and Gullberg (2008) investigated the relationship between L1 and L2 with regard to both speech and gesture. They compared manner expressions in Japanese monolingual speakers, Japanese intermediate learners of English and monolingual English speakers. Manner expressions were elicited through narrative descriptions of a cartoon. They found influences of L1 on L2. The pattern of this influence was even stronger in gesture. They found that monolingual the Japanese speakers as well as the Japanese learners of English occasionally expressed manner in their gesture only, which is a phenomenon called 'manner fog' according to McNeill (2001), whereas monolingual English speakers did not display that pattern. The key finding to this discussion here is that this phenomenon seems to be an influence of their L1. This result shows that L2 gestures can be shaped by L1.

Gestural expression of motion events of Spanish native speakers and English native speakers as well as Spanish advanced learners of English and English advanced learners of English was studied by Negueruela, Lantolf, Jordan and Gelabert (2004). They specifically investigated the place where (in speech) path gesture occurred.

In regard to native speakers, they found that Spanish speakers were more likely to produce path gestures along with ground noun phrases or verbs, whereas English speakers tended to produce path gestures with ground noun phrases or satellites. This is in line with findings from previous studies (McNeill, and Duncan, 2000; Stam, 1999; Kellerman, and Hoof, 2003). In regard to L2 learners, it was found that both groups continued on placing path gestures the way they do in their L1. This means that these advanced learners preserved patterns of thinking for speaking of their L1.

Retaining the thinking for speaking patterns in expressing motion events in L2 was also the case in a study by Choi, and Lantolf (2008). They compared expressions of manner and path in English advanced learners of Korean and Korean advanced learners of English. Manner and path were elicited through narratives of a cartoon. They found that although the learners in the study were advanced, they retained their L1 typology in expressing manner and path in their L2. This means that the L2 Korean speakers used the satellite-framed language typology of their L1 English in expressing motion events, and the L2 English speakers used the verb-framed language typology of their L1 Korean in expressing motion events.

Expression of the path component of motion events was also examined in speech and gesture in Spanish native speakers and English native speakers and Spanish intermediate as well as advanced learners of English in studies by Stam (1998, 2006a, 2006b), discussed in sections 2.5.1.2.2 and 2.5.2.2. For the native groups, it was found that Spanish speakers produced path gestures along with the path verb, whereas English speakers produced them

with satellites or prepositions of motion. This was in agreement with findings in previous studies (Talmy, 1985, 1991, 2001; Slobin, 1996; Berman, and Slobin, 1994; Slobin, and Hoiting, 1994; McNeil, and Duncan, 2000). For L2 learners, it was found that intermediate and advanced learners of English produced path gestures with ground noun phrases, satellites as well as with more than a single component (verbs and satellites) (Stam, 1998, 2006a, 2006b). This is similar to what native English speakers do. However, intermediate learners of English produced fewer path gestures that co-occurred with verbs than native English speakers. With regard to speech, advanced learners of English were more target-like. Thus, the influence of both L1 and L2 was found in their gesture.

To my knowledge, gestural expressions of motion events in L2 learners have only been studied in intermediate and advanced learners. How would verb-framed language speakers, who are also early L2 learners of a satellite-framed language, express motion events gesturally? Would their gestures follow the typology of their first or second language?

Moreover, to the best of my knowledge, the expression of motion events in gesture in Arabic leaners of English has not yet been examined. These issues are investigated in this study. Unlike the above-mentioned studies, the focus of the motion events here will be on the two components of the motion, namely manner and path. It is not yet known whether their use of gesture will follow their language typology, or if gesture will be target-like and thus indicates signs of development in L2.

4.1.2 Communicative demand

Limited linguistic resources in early L2 learners and their inability to communicate effectively due to low language proficiency seem to make communicative demand for gesture higher. Limitations of grammatical and lexical abilities among second language learners' L2 speech cause them to use gesture to overcome these obstacles to communication. When the

demand to communicate effectively is very high, the shape, space and rate of gestures may change. This is discussed in detail in the following sections.

4.1.2.1 Communicative demand influence on dual gestures

Higher communicative demand can influence the 'informativeness' of gestures. It can make them more informative. This was noted in a study which compared a speaker's gestures produced while describing an action to a listener who had information about that action, to those produced while describing the same action to a listener, who did not have the information about that action (Gerwing and Bavelas 2004). It was found that gestures used in the case of having shared knowledge with the listener were less informative than gestures produced in the case of not having shared knowledge with the listener.

Since low proficiency L2 leaners have such a high communicative demand for gesture, would early L2 leaners' gesture be more informative during their L2 speech than their L1 speech? This question is investigated in the current study through examining dual gesture production in L1 and L2.

The function of dual gestures established in Chapter Three in section 3.1.1.2 is specifically expressing the existence of two participants who are playing the exact roles in performing a certain action. Expressing this type of events by using dual gestures such as using two flat hands (each one representing a different entity) or two extended fingers of a single hand is more informative than expressing it with non-dual gestures such as one flat hand or with an extended index finger of a single hand. This is because the dual gesture expresses the concept of two more clearly. Given how meaningful and informative dual gestures are, it is predicted that Arabic early learners of English will produce more dual gesture while speaking L2 English than while speaking L1 Arabic.

4.1.2.2 Communicative demand influence on gesture space

High communicative demand can make gestures bigger in size. This was also observed in the previously mentioned study of Gerwing and Bavelas (2004). In a qualitative analysis, they compared gestures produced by a speaker while talking about new information to those he produced while talking about already given information. They found that gestures accompanying the new piece of information were larger than those used to accompany information which had previously been supplied. This suggests that communicative demand encourages the speaker to use larger gestures.

A similar effect was also shown in another study from the perspective of individual differences. An individual's level of empathy can influence 'gesture saliency'. In other words, it can affect the use of gesture space. It has been observed that people with high empathy produce more salient gestures (Chu, Meyer, Foulkesand and Kita 2014). This means that people who are empathetic tend to feel high communicative demand. They feel they want to communicate more effectively with their recipients and consequently their gestures become more salient.

Gesture space of Japanese intermediate and advanced learners of French in the L2 culture was investigated in a study by Kida (2005). It was found that their gestures became larger resembling the gesture space feature of their L2. However, there is a limitation in this study. If French L1 gestures are bigger than Japanese L1 gestures, then it is not clear if the change is due to communicative demands or acquiring the L2 gesture feature.

The current study does not have this drawback. This is because Arabic L1 gestures are bigger than English L1 gestures. So, if gestures of Arabic learners of English became even bigger, it might be the effect of higher communicative demand. If they became smaller, it might be due to the L2 gesture feature acquisition.

What about gesture space of representational gestures of early second language learners? To the best of my knowledge, gesture space has been examined only in intermediate and advanced second language learners. Specifically, gesture space of in Arabic early learners of English has not been studied. Would their gesture be even larger while speaking L2 than L1? Would they be smaller? Or would they be the same in both cases? These questions are investigated in the current study.

4.1.2.3 Communicative demand influence on gesture rate

Situations where communication is highly demanded can also increase gesture frequency. Further, speakers use more representational gestures when the information they are explaining is more valuable to their addressees. This has been observed in a study by Kelly, Byrne and Holler, (2011), in which participants were asked to pretend to explain a scenario about surviving in the wilderness to two groups; one was going to go camping in the mountains, and the other was not. They found that representational gesture production was three times higher while explaining to the group that was going camping. Thus, the extent of how useful and relevant the information is to the audience can influence the speaker's gesture rate.

Higher communicative demand for gesture in early L2 learners influences their gesture rate. Gesture in low proficiency in French student learning Swedish and Swedish students learning French was investigated in a study by Gullberg (1998), discussed in section 2.5.1.1.1. It was found that the L2 learners at low proficiency levels tended to use gesture as a strategy for the purpose of improving communication. In the case of lexical problems, learners produced more iconic gestures to express properties such as size, shape or manner. Through these gestures, they were trying to show their native addressees their inability to

access certain lexical items, and hopefully get their support. It was also found that the lower the proficiency level, the higher gesture rate was.

In cases where L1 is a high-gesture-frequency language, would early L2 learners produce an even higher rate of gestures while speaking their L2, which is a low-gesture-frequency language? Or would they produce similar gesture rate while speaking both L1 and L2?

To the best of my knowledge, the rate of representational gestures of Arabic early leaners of English has not yet been explored. This question is investigated in the current study.

Due to the higher communicative demand for gesture while speaking L2, it is expected that early L2 learners will produce a higher rate of representational gestures. Further, based on Gullberg's (1998) above-mentioned finding of the strategic use of a higher rate of iconic gestures to improve communication, it is expected that Arabic early learners of English will produce a higher number of gestures during their L2 speech than their L1.

Main Research Questions

1. How do speakers vary in their use of manner and path gestures when they are speaking their first language (Arabic) and their second language (English)?

2. How do speakers vary in their use of dual gestures when they are speaking their first language (Arabic) and their second language (English)?

3. How do speakers vary in their use of gesture space when they are speaking their first language (Arabic) and their second language (English)?

4. How do speakers vary in terms of their gesture rate when they are speaking their first language (Arabic) and their second language (English)?

4.2 Methodology:

The same methodology that was applied in Chapter 3 in section 3.2 was also applied here using the same stimuli of the Tomato Man to elicit speech and gestures. Having used the Tomato Man videos in the previous study to compare between gesture features in English and Arabic, it was decided to use the same stimuli here. Moreover, story-retelling technique has been used successfully in studies of L2 acquisition as in Klein, and Perdue (1992), Gullberg (1998), Ozurek (2002), Yoshioka, and Kellerman (2006), Brown (2008), and Brown, and Gullberg (2010).

4.2.1 Participants[2]

Fourteen native Saudi Arabic speakers participated in the study two of whom were females and twelve were males. All are beginner learners of English. They are learning English in English Language institutions in the West Midlands region, in the United Kingdom. In their English language institutions, they are enrolled in classes for beginners. They also filled in a language background questionnaire adapted from Gullberg and Indefrey (2003) (see Appendix B). In addition, they filled in an L2 language exposure questionnaire (see Appendix C). Participants have been in the United Kingdom for three months at most. They have watched English movies and programs but all had been translated into Arabic. They are between 19 and 28 years of age.

4.2.2 Procedure

The same procedure used in Chapter Three was also applied in this study (see section 3.3.1.4). However, in this study, each participant was asked to go through the experiment twice; once in Arabic and another in English. Concerning this, counter-balance was applied.

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[2] The speakers who participated in this study are different than the ones who participated in the previous study in Chapter Three

Half of the participants began with Arabic descriptions, and the other half began with English descriptions. An English native speaker listened to the participants' descriptions in English, and an Arabic native speaker listened to their Arabic descriptions. In addition, the listener was of the same gender as the participant respectively. This was done to get participants be more confident and relaxed while describing because they come from a conservative society.

4.2.3 Coding

The same system that was used in Chapter Three to code manner and path and dual-ness in speech was also used in this study. Arabic speakers' ways of packaging manner and path syntactically as well as expressing dual-ness which were identified in Chapter Three were also detected in Arabic speakers in the current study (see sections 3.3.1.6.1 and 3.3.1.6.2).

In L2 English, speakers used slightly different structures in expressing manner and path. These structures are highlighted with examples in the following section.

4.2.3.1 Manner and path speech coding

Two ways of syntactic packaging were also identified in this study; tight and loose (see section 3.3.1.6.1). Syntactic packaging of manner and path was the same in L1 Arabic speakers both in this study and the previous study. These structures were discussed in detail with examples in (section 3.3.1.6.1). With regard to L2 English, tight and loose clauses were also used to package manner and path syntactically.

In tight clauses, manner and path were conveyed using the following structures. First, they were expressed by the verb *go* followed by a manner prepositional phrase which was followed by a directional path satellite that was optionally followed by a directional path prepositional phrase as in (1a). Second, manner and path were conveyed by using a manner verb followed by a directional path prepositional phrase which was sometimes preceded by a

directional path satellite as in (1b). Third, manner and path were also expressed by a directional path satellite followed by a manner adverbial or prepositional phrase as in (1c).

Example (1)

a. "Tomato go in the circle down in the beach."

(SL2-A15, Roll+Down)

b. "The tomato jump down."

(SL2-A19, Jump+Down)

c. "It is down like circle."

(SL2-A21, Rotate+Down)

In L2 English loose manner clauses, manner was expressed by a manner verb as in (2a). This manner clause structure was also used by native speakers of English in Chapter Three (see section 3.3.1.6.1).

In L2 English loose path clauses, path was sometimes conveyed in similar structures to those used by native speakers of English in Chapter 3. Path in these structures was expressed by using the following ways. First, path was expressed by the verb *go* or the verb *come* followed by a directional path satellite or prepositional phrase as in (2b). Second, path was also conveyed by a directional path verb followed by a directional path satellite or a prepositional phrase which could be followed by another directional prepositional phrase as in (2c). Third, it was also expressed using other structures like a directional path verb as in (2d). Fourth, path was conveyed by the verb *jump* followed by a directional path prepositional phrase as in (2e) to indicate diving into the sea. Fifth, sometimes speakers used the word *circle* as a verb or as a noun to express path as in (2f). This structure was also used by Arabic speakers in Chapter 3 (see section 3.3.1.6.1).

Example (2)

a. "This green jump."

(SL2-A27, Jump+Up)

b. "Triangle go up."

(SL2-A23, Rotate+Up)

c. "Triangle *nzl* [descended] down this in the tomato."

(SL2-A24, Roll+Down)

d. "Tomato fall."

(SL2-A18, Rotate+Down)

e. "The red jump in the sea."

(SL2-A26, Rotate+Down)

f. "The triangle circle the tree."

(SL2-A19, Jump+Around)

4.2.3.2 Dual-ness speech coding

Two types of two-character interaction events were also identified in this study; dual and non-dual. Ways of expressing dual-ness in speech in L1 Arabic speakers in this study and in the study in Chapter Three did not differ. In L2 English, speakers used similar structures as those produced by native speakers English in Chapter Three (see section 3.3.1.6.2). Dual-ness in their speech was expressed using the following structures. First, it was conveyed by using a unified noun that consisted of two characters as the subject as in (3a). Second, dual-ness was also expressed by the plural pronoun *they* referring to two characters as in (3b). Third, it was expressed by nominating one of two the characters as the subject followed by a singular verb form, followed by the preposition *with*, followed by the other character as in (3c). Fourth, they sometimes used the words *both* or *together* to convey this meaning as in (3b).

Example (3)

a. "Triangle and tomato diving."

(SL2-A18, Tumble+Down)

b. "They go up together."

(SL2-21, Spin+Up)

c. "Triangle go up with tomato."

(SL2-17, Jump+Up)

Non-dual events expression techniques in L1 Arabic speakers were the same in the two studies. L2 English speakers in this study used the same techniques in expressing non-dual events as those used by native speakers of English in the study in Chapter 3 (see section 3.3.1.6.2). They expressed non-dual events by making one of the characters the subject and the other character either the object of the verb as in (4a) or an object of preposition as in (4b).

Example (4):

a. "Triangle hit this tomato."

(SL2-15, Roll+Down)

b. "The green stay behind tomato."

(SL2-19, Rotate+Down)

4.2.4 Gesture Coding

Gestures that expressed manner and path, dual-ness in gestures, as well as gesture space and gesture rate were also coded using the same coding techniques as those used for coding these features in the study in Chapter Three (see sections 3.3.1.7, 3.3.1.7.1, 3.3.1.7.2, 3.3.1.7.3 and 3.3.1.7.4).

4.3 Results:

4.3.1 Manner and path

Manner and path speech

The purpose of this analysis was to investigate whether L1 Arabic typological syntactic packaging of manner and path is transferred to L2 English in early L2 learners. First, types of linguistic constructions in the L1 Arabic and L2 English responses were analyzed. Responses that contained only manner or only path were excluded from the analysis. Then, a paired t-test was applied to calculate the percentage of conflated (tight) clauses in Arabic as L1 and English as L2 within subjects. The percentage of conflated clauses was higher in English as a L2 (N = 10) than in Arabic as L1 (N = 10), the paired t-test was close to significant, t (7) = -2.031 , p = .082) (see Figure 1).
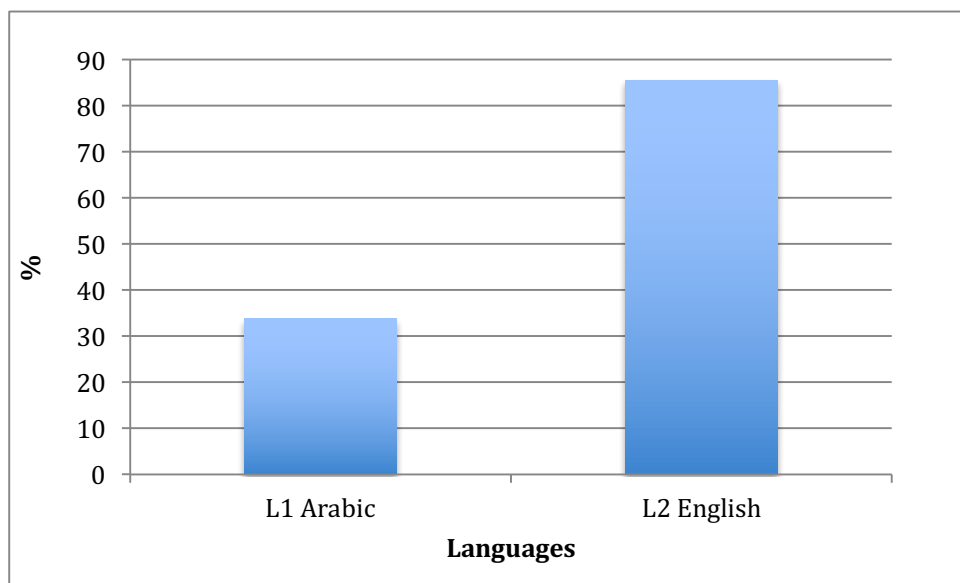

Figure 1: Proportions of conflated clauses in L1 Arabic and L2 English

In this analysis, although the difference was not significant, descriptive statistics indicate that when manner and path were simultaneously mentioned in their speech, the speakers syntactically packaged manner and path with more conflated (tight) clauses when

157

they spoke English as their L2 than when they spoke their L1, which was Arabic. This indicates that the speakers tended to use the target language typology of syntactic packaging of manner and path information rather than that of their L1. Perhaps, the result would have shown more significance if the speakers had been more advanced in L2 English.

Example (5) illustrates the key finding: the speaker syntactically packaged manner and path in different ways in his L1 Arabic and in his L2 English. He followed the language typology of the languages he spoke.

Example (5)

a. ‏‏‏"المثلث الأخضر ينقز، لين وصل فوق عند الدائرة الحمرا".

(SL1-A25, Jump+Up)

Literal Translation:

‏[at]عند ‏[up]فوق ‏[arrived]وصل ‏[until] ‏لين‏[jumps]ينقز ‏[the green]الأخضر ‏[the triangle]المثلث ‏[the circle]الدائرة‏[the red]الحمرا.

English Meaning:

The green triangle jumps until he arrived up to the red circle.

b. "The green jump to up."

(SL2-A25, Jump+Up)

The speaker described the same clip, and expressed the same idea in both languages: the Green Triangle jumping up. In L1 Arabic, he used two clauses to express manner and path, with each element in a separate clause. By contrast, he used one clause to convey both manner and path in L2 English. This means that in his L1 speech, the speaker followed the typology of his L1, whereas in his L2 speech, he followed the typology of his L2. This shows that the speaker is grasping the typology of syntactic packaging of spatial components of the

second language. One could argue that he is following the thinking for speaking pattern of the target language.

Manner and Path Gestures

This analysis examined gestural packaging of manner and path in speakers of L1 Arabic and L2 English. The purpose here was to investigate whether gestural expression of manner and path by early L2 learners followed the typology of their L1 or L2. The aim was to see whether the target language thinking for speaking had more effect on gesture, or if the typology of the speakers' L1 (Arabic) was transferred to their L2 (English).

In order to achieve this, motion events that were only expressed by manner only and path only gestures were excluded from the analysis. The percentage of conflated gestures produced with L1 Arabic and L2 English were calculated and compared within subjects. The proportion of conflated gestures in L2 English (N = 10) was higher than in L1 Arabic (N = 10). The paired t-test showed marginal significance t (9) = -2.247, p = .051) (see Figure 2). This analysis indicates that when both manner and path were gesturally expressed, the Arabic early learners of English in this study tended to use the typology of the target language while speaking their L2 English.
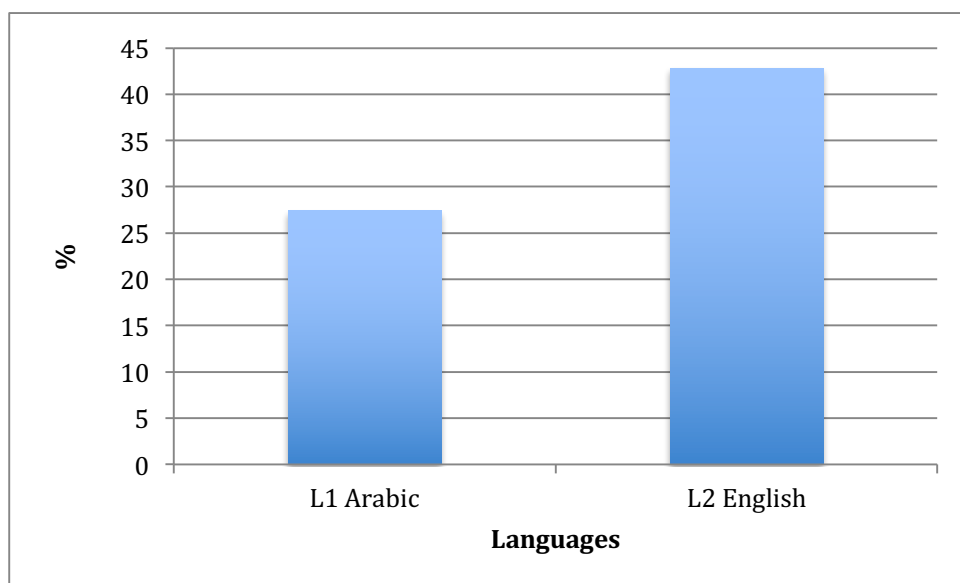
Figure 2: Proportions of conflated gestures in L1 Arabic and L2 English

However, within L2 there is evidence that the speakers produced more separated gestures than conflated. Figure 2 shows that while speaking L1 Arabic, these learners expressed manner and path with conflated gestures about 27% of the time and with separated gestures about 73% of the time. This indicates that during their L1 Arabic speech, they tended to separate manner and path in gesture rather than to conflate them, which is in line with the Arabic typology in expressing motion events. It also demonstrates that while speaking L2 English, they expressed manner and path with conflated gestures about 43% of the time, and with separated gestures about 57% of the time. This means that they also had a tendency to separate gestures rather than to conflate them while speaking their L2. Thus, they showed more L1 patterns than L2 patterns while speaking L2. Thus, although these learners may have made progress in grasping some L2 patterns, they may have not completely reached the target point.

In order to find out to what extent these learners have reached the target language patterns with regard to conflating gestures while expressing manner and path, I compared

their manner and path gestural expressions while speaking their L2 English with the manner and path gestural expressions of L1 English from the previous study in Chapter Three. Only descriptions of motion events containing both elements were included in this analysis. The percentage of conflated gestures produced by L1 English speakers and L2 English speakers were calculated and compared between subjects. The proportion of conflated gestures in L1 English (N = 13) was significantly higher than L2 English (N = 10). As Levene's test showed significant difference in variances between two groups, I used a t-test that does not assume equal variances, t (20.854) = 2.987, p = .007) (see Figure 3).
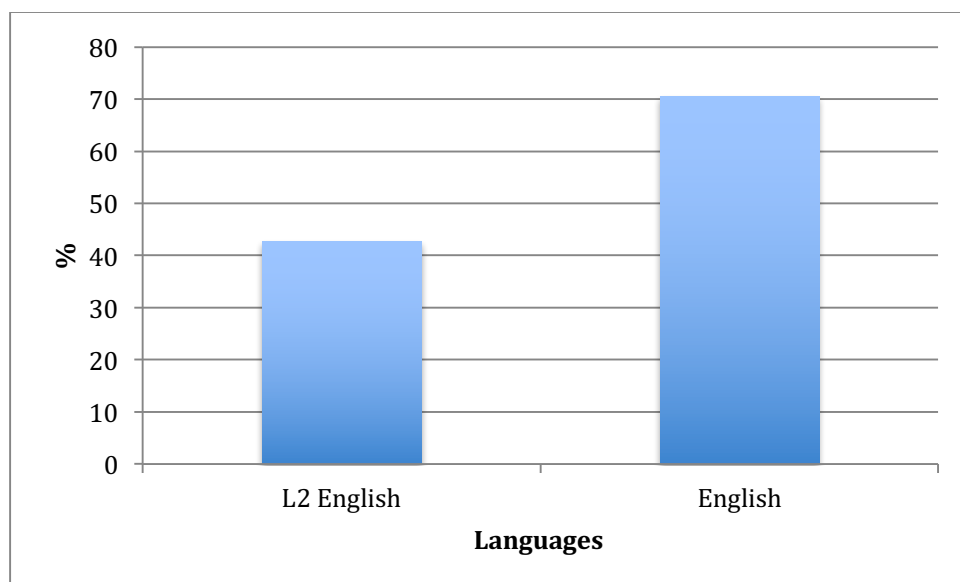
Figure 3: The Proportions of Conflated Gestures in L1 English and L2 English

Example (6)

In Example (6), the L1 English speaker (6a) and the L2 English speaker (6b) expressed the same idea while describing the event Tumble Down in speech. In speech, the L1 English speaker followed her own language typology and conflated manner and path, whereas the L2 English speaker followed the typology of her L2. In gestures, each speaker followed their own language typology while speaking English. This example illustrates the

key finding that the Arabic early learners of English might be moving towards L1 English patterns with regard to packaging manner and path in gesture, but they have not completely reached it yet.

a. "and then like twisted down into the water."

(SL1-E7, Tumble+Down)

b. "Triangle go in the the sea around."

(SL2-A15, Tumble+ Down)

In (6a), the L1 English speaker described the Tumble Down event with a conflated clause. She followed her language typology in speech. She conveyed the Tumble Down idea by the manner verb *twist* with the satellite *down.*

In her gesture, she also followed her L1 English typology by producing a single gesture conflating manner and path. As the speaker ended the word *like* and starting uttering the word *twisted*, she started performing that conflated gesture. She started moving her right hand with an extended index finger in a circular movement from the Peripheral area to the top of her right shoulder downwards. She ended the gesture when her hand reached the Centre area as she was saying *down* (see Figure 4).

Figure 4: The gesture conflating manner and path E7 produced while expressing the manner and path in 'twisted up' in L1 English

In (6b), the L2 English speaker described the Tumble Down also with a conflated clause. In her speech, she followed the language typology of English, her second language. She expressed the idea of the Green Triangle tumbling down with the path phrase *go to the sea* and the manner satellite *around*. Since she used L1 English typology in her speech, it might mean that this L2 English speaker is moving towards L1 English pattern.

In her gesture, this L2 English speaker showed a totally different pattern than her speech pattern and then L1 English gesture patterns. She packaged the manner and path of the Tumble Down event separately by using manner gestures and path gestures. As the speaker uttered the first *the*, she produced a considerably smaller downward path gesture with her right index from the top of the Centre area below her neck to the top of the Centre Centre area. Then, with the other *the* she made another small downward path gesture with the same index finger from the point where she ended the last gesture downwards (see Figure 5).
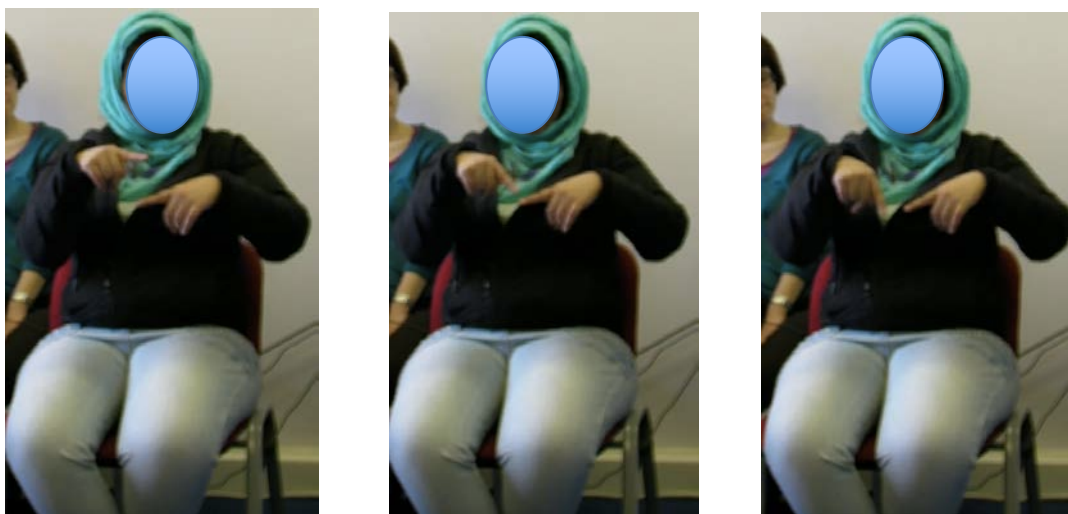
Figure 5: The first path gesture A15 produced to express the path in 'go in the sea'

As she finished uttering the word *sea*, she started performing a manner gesture using the index fingers of both of her hands. She made two circles with her hands at the top of the Centre area near her chin. Then, as she uttered the word *around*, she started performing the other manner gesture, which was similar to the previous manner gesture and in the same area.

163

It seems that the L2 English speaker followed her L1 Arabic typology by packaging manner and path separately (see Figure 6).

Figure 6: The second manner gesture A15 produced in order to express the manner in 'around'

Thus, the L2 English speaker used different patterns in speech and gesture. She showed a shift towards L2 thinking for speaking patterns in her speech by conflating manner and path. However, separating these two components in gesture may indicate that she has not completely reached the patterns of the target language.

4.3.3 Dual-ness

Here, the focus of the analysis is on representational gestures that accompany utterances that describe two-character events. All two-character events were further divided into dual event clauses and non-dual event clauses (for examples on the two types, see section 4.2.3.2). The average percentage of dual event clauses (among all two-character event clauses) was 23 % for L1 Arabic speakers and 28 % for L2 English speakers. The average percentage of non-dual event clauses (among all two-character event clauses) was 77 % for L1 Arabic speakers and 72 % for L2 English.

The percentage of dual gestures was calculated among all representational gestures depicting characters' motion. The percentage of dual gestures was significantly higher in L2 English than L1 Arabic (N=14). The paired t-test shows significant difference in variances within subjects. Paired t-test that does not assume equal variances, t (13)= -2.243, *p* = .043 (see Figure 7).
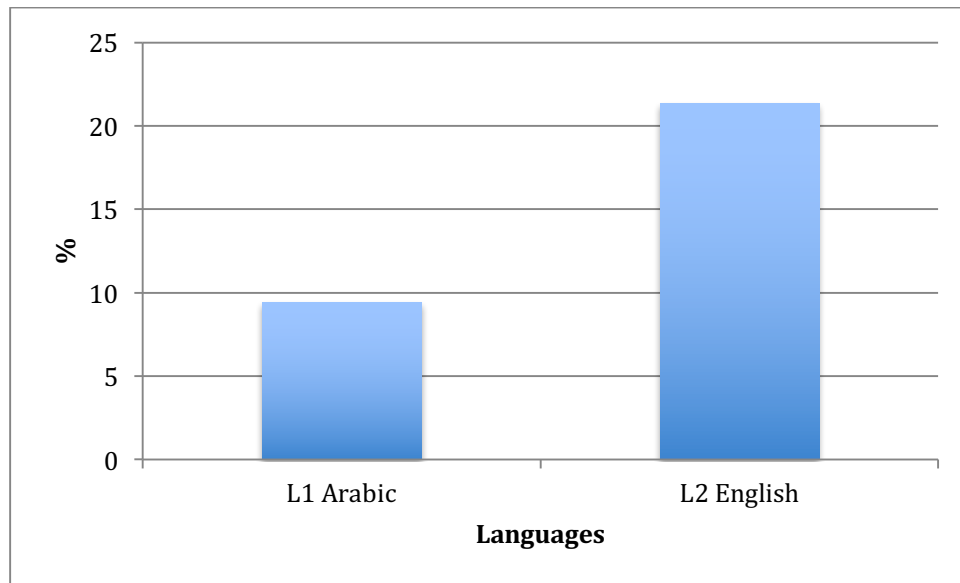
Figure 7: Proportions of dual gestures in L1 Arabic and L2 English

Example (8) below illustrates the key finding: the increase of the use of dual gestures by Arabic early learners of English while speaking their English L2. The speaker expressed the concept of two-ness in his L1 Arabic and in his L2 English in gesture differently.

Example (7)

a. ''و راحو سوى''.

(SL1-A19, Spin+Down)

Literal Translation:

و[and] راحو[went they] سوى[togethr].

English Meaning:

And they went together.

b. "And go together."

(SL2-A19, Spin+Down)

It has been established in Chapter 3 that native Arabic speakers use more dual gestures than native English speakers. This feature of Arabic speakers is increased while speaking L2. Example (8) represents how L2 learners in this study typically expressed dual events gesturally compared to the way they expressed them in their first language. The participant expressed exactly the same meaning in L1 Arabic and in L2 English, which was the going of the two characters together. However, his English speech was accompanied by a dual gesture, whereas his Arabic speech was not.

In L2 English, as the participant uttered the word "and", he started performing a gesture using his left hand with two extended fingers; the index and middle fingers. He moved his hand in this shape from the peripheral area in front of his face outwards representing the event of the going of the two characters together (see Figure 8).

Figure 8: The 2-finger dual gesture A19 produced while expressing the dual event of the going of the two characters together in his L2 English speech

By contrast, in L1 Arabic, as the speaker uttered the word "and", he also started to perform a gesture which represented the dual event of the going of the two characters together. However, the shape of his hand while making the gesture this was different. He performed a gesture using his left hand with only one extended index finger, representing the

two characters. He moved his hand from in front of the right upper Centre area in a downward movement and towards the left, until it reached in front of the left bottom Centre area (see Figure 9).

Figure 9: The 1-finger gesture A19 produced while expressing the dual event of the going of the two characters together in his L1 Arabic speech

4.3.4 Gesture space

The focus of the analysis here was only on representational gestures that were produced during descriptions of all motion events. The percentage of Extreme Peripheral gestures, which represented the largest gestures, was higher in L1 Arabic than in L2 English (N=14), but it was not statistically significant, t (13) = -.383, p = .708 (see Figure 10). This means that the speakers maintained the L1 feature of gesture space while speaking their L2. They continued using larger gesture space while speaking their L2.
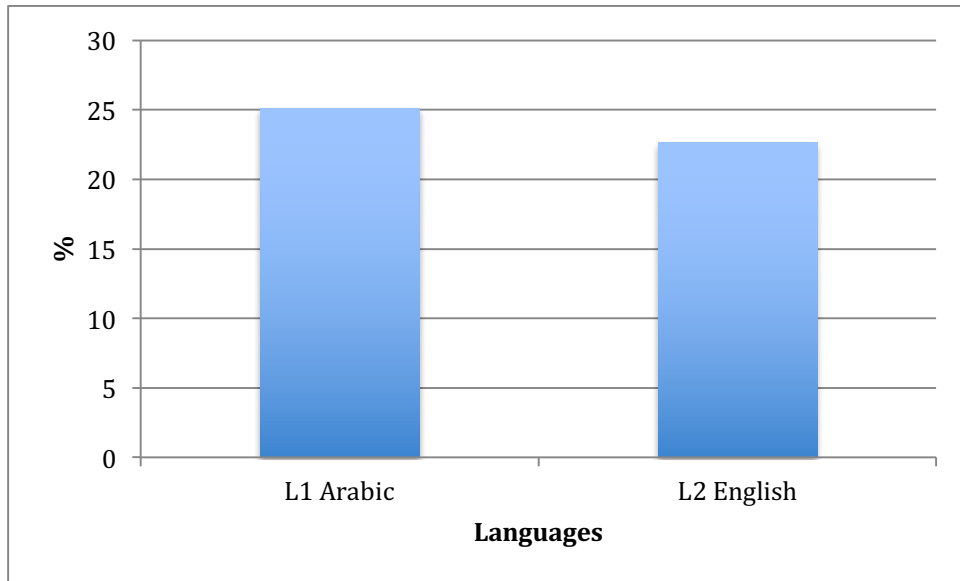
Figure 10: Proportions of Extreme Peripheral gestures in L1 Arabic and L2 English

Example (9) below demonstrates the key finding; the speaker maintained his L1 feature of gesture space while speaking his L2. He used large gestures in both languages.

Example (9)

a. ''تطلع فوق.''

(SL1-A23, Roll+Up)

Literal Translation:

تطلع[she ascends] فوق[up].

English Meaning:

She ascends up.

b. "And up tomato."

(SL2-A23, Roll+Up)

Example (9) may indicate the way Arabic early learners of English in this dataset maintained the gestures space property of their L1 Arabic while speaking their L2 English. In example (9), the speaker described the same motion event. He also expressed the same idea of the ascending of the tomato. Moreover, his Arabic and English speech was accompanied

168

by an upward path gesture which was performed in the Extreme Peripheral area above his right shoulder.

In L1 Arabic, as he said the word "ascends", he started performing a path gesture. He moved his right hand from a point in the Peripheral area above his right shoulder upwards, until it reached to a point in the Extreme Peripheral area (see Figure 11).

Figure 11: The Extreme Peripheral gesture A23 produced while expressing the upward movement in his L1 Arabic speech

In L2 English, as he uttered the word "up", he started making his path gesture. He moved his right hand from a point in the Peripheral area in front of his body upwards, until it arrived at a certain point in the Extreme Peripheral area above his right shoulder and to the right (see Figure 12).

Figure 12: The Extreme Peripheral gesture A23 produced while expressing the upward movement in his L2 English speech

4.3.5 Gesture rate

This analysis investigated the rate of representational gestures produced by Arabic early learners of English while speaking L1 Arabic and L2 English. It was established in Chapter 3 that Arabic is a high-gesture-frequency language. In contrast, it was seen that English is a low-gesture-frequency language according to the study in Chapter 3 and to Graham and Argyle (1975) (see section 3.1.2 and 3.3.4).

The goal here was to examine if speakers of Arabic early learners of English produced a higher or lower rate of gestures while speaking their English L2. So, the rate of gesture in L1 Arabic and L2 English was compared within subjects. Only representational gestures were included in the analysis. A paired t-test was applied in order to calculate the percentage of representational gestures per 100 words in L1 Arabic and L2 English within subjects.

The rate of representational gestures of Arabic speakers while speaking L1 Arabic (N=14) was lower than while speaking L2 English. But the difference was not statistically significant, t (13) = -.801, $p = .438$.

This means that Arabic early learners of English in this study maintained their L1 gesture feature of gesture rate while speaking their L2. They continued on producing a high rate of gestures.
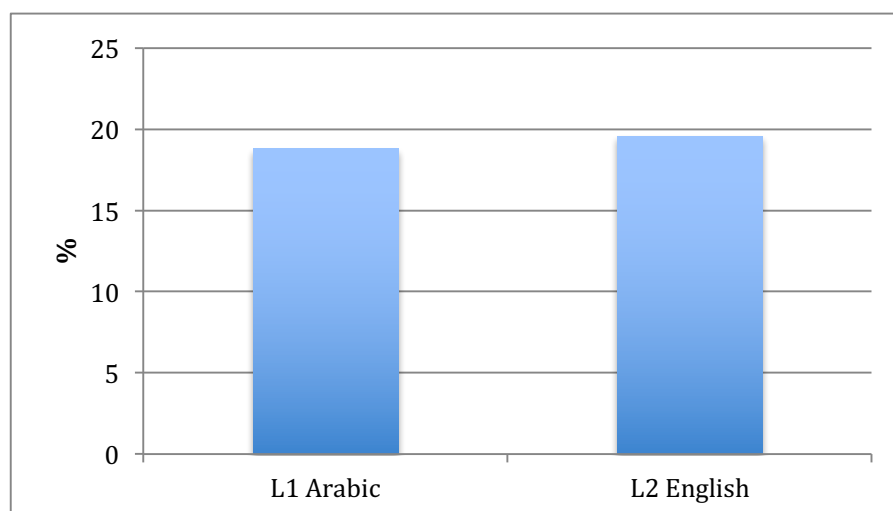
Figure 13: Rate of representational gestures (Number of representational gestures per 100 words) in L1 Arabic and L2 English

Example (10) below illustrates the key finding: the speaker maintained the gesture rate feature of his L1 while speaking his L2. He produced the same number of gestures in the same clause while speaking his L1 and while speaking his L2.

Example (10)

a. "بعدين مشو مع بعض."

(SL1-A26, Spin+Up)

Literal Translation:

بعدين[then] مشو[walked they] مع[with] بعض[each other].

English Meaning:

Then, they walked with each other.

b. "And go with him."

(SL2-A26, Spin+Up)

In this example, the speaker described the final event in the Spin+Up clip of the Tomato Man, where the two characters (The Tomato Man and the Green Triangle) leave the scene with one another. He expressed the same idea of leaving together in L1 Arabic and in L2 English: in L1 Arabic by using the verb 'walked', and in L2 English by using the verb 'go'.

In L1 Arabic speech, he produced four words. Throughout these four words, he produced a single gesture representing the two characters leaving the scene. He used right flat hand to perform the gesture. As he started saying 'then', his right hand started moving from the resting position on the right side of his lab upwards, until it finally reached the area in front of his right arm (see Figure 14).

171

Figure 14: The single representational gesture A26 performed while expressing the action of the leaving of the characters in L1 Arabic

In L2 English speech, he also produced four words. Again, he only produced a single gesture throughout the entire clause. The gesture he produced also represented leaving action of the two characters. As he started uttering the verb 'go', he started performing the gesture. He used his right flat hand here, too. He started his gesture from the area above his right lab upwards and towards the right, until it reached the Peripheral area in front of his right arm (see Figure 15).
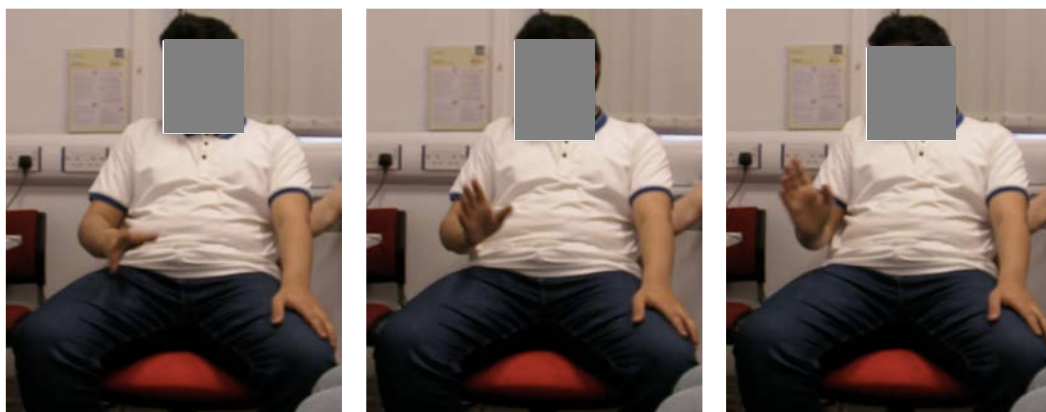
Figure 15: The single representational gesture A26 performed while expressing the leaving of the characters action in L1 English

Thus, this example demonstrates the result that Arabic early learners of English tend to keep gesture rate feature of their L1 while speaking their L2. The speaker in example (10) produced a single gesture while speaking both languages and expressing the same idea.

172

4.4 Discussion:

This study explored features of gestures of L2 learners in light of the factors which shaped these features. L2 gestures were examined using a comparison between L1 and L2 of Arabic early learners of English in respect to expression of motion events, dual gesture, gesture space and gesture rate. The results are discussed here in relation to the literature.

4.4.1 Manner and path

This study investigated packaging of manner and path in speech and gesture in early L2 learners. Expressing manner and path in speech and gesture was compared in L1 and L2.

In speech, early L2 learners had a tendency to follow the typology of the target language. The speakers in this study are native speakers of Arabic, which is a verb-framed language according to the study conducted in Chapter Three, Almurshidi (2013) and Talmy (2007). They are learning English, which is a satellite-framed language according to the study conducted earlier in Chapter Three, Özyürek and Kita (1999), Kita & Özyürek (2003), Allen et al. (2007), Almurshidi (2013) and Talmy (1985) (see sections 2.4.4, 3.1.1.1 & 3.3.1). Although they are early learners of English, it seems they had a tendency to follow the typology of the target language in packaging manner and path while speaking their L2 English than while speaking their L1 Arabic (see section 4.3.1).

In gesture, verb-framed languages are more likely to separate gestures when expressing manner and path, whereas satellite-framed languages are more likely to conflate manner and path into a single gesture (Kita, & Özyürek 2003). In this study, while describing motion events, Arabic learners of English tended to produce more gestures that conflated manner and path while speaking L2 than while speaking L1. This shows a shift towards the typology of the target language in expressing motion events. This was assumed because the Arabic speakers in this study conflated manner and path in gesture while speaking L2 English

than while speaking L1 Arabic. However, after looking closely at their L2 data, it turned out that they actually had a greater tendency to separate manner and path than conflate them while speaking L2 English.

Furthermore, it was found that the L1 English speakers from the previous study in Chapter Three produced significantly more conflated gestures than the L2 English speakers. This may demonstrate that although the L2 learners here seem to be making progress in their L2, they have not yet reached the target language patterns. They have not yet acquired the typology of their L2 in expressing motion events.

Syntactic packaging of manner and path reflects thinking for speaking patterns (Slobin 1996). This means that Arabic early learners of English might have started to acquire thinking for speaking patterns of their L2 because they showed more L2 patterns in their L2 gesture than in their L1 gesture. However, it seems that they were more likely to follow the thinking for speaking patterns of their L1 Arabic. This is reflected in their L1 Arabic like gesturing as they expressed manner and path in separated more than conflated gestures while speaking L2 (see section 3.1.1.1).

This result shows similarities between Arabic early learners of English and Spanish intermediate learners of English in studies by Stam (1998, 2006), discussed in sections (2.5.1.2.2, 2.5.2.2 & 4.1.2.1.2). Although the L2 speakers in this study and in Stam's (1998, 2006) studies are different in regard to L2 level, both groups followed the typology of their L1 in gestural expression of motion events. However, the intermediate learners in Stam's studies seem to also show an influence of the target language.

Such similarities between L1 thinking for speaking patterns in early language learners and intermediate learners might not represent a contradiction. On the contrary, these results appear to complement each other. Perhaps when language learners begin speaking a language, they continue on using the L1 thinking for speaking patterns as in the early L2

speakers in this study. The current study provides evidence on early L2 learners' thinking for speaking patterns. Then, at the intermediate level, they start thinking more carefully when speaking L2, which may be why there have been incompatible results by various studies in terms of intermediate language learners' expression of manner and path. On the one hand, in the above-mentioned studies of Stam (1998, 2006), intermediate L2 learners' gestures showed influence of both L1 and L2 in their gesture. On the other hand, it has been seen how intermediate Dutch learners of Japanese maintained L1 thinking for speaking patters in terms of their gesture during describing motion events in study by Yoshioka and Kellerman (2006) (see sections 2.5.1.2.2, 2.5.2.2 & 4.1.2.1.2). In advanced learners who have more control over their L2, they express more target-like thinking for speaking patterns.

The agreement of the typology used to express manner and path between speech and gesture is compatible with what has been found by the studies of Özyürek, Kita, Allen, Furman, & Brown (2005) and Özyürek, et al., (2008). These studies showed that the gestural representation of manner and path is affected by the syntactic packaging of manner and path that the speaker chooses to use.

Thus, this study contributes to the existing literature in showing how early language learners tend to follow patterns of thinking for speaking of the first language. This study showed that early L2 learners in this study tend to follow the typology of their L1 in expressing manner and path while speaking L2 in both speech and gesture.

4.4.2 Dual gesture

This study examined dual gestures in early second language learners. This was done through a comparison between dual gestures is L1 and in L2.

Chapter Three showed that native Arabic speakers use more dual gesture than English speakers, which indicates that the use of dual gestures is language-specific (see section 3.3.2).

Despite that, in this study, it was found that Arabic learners of English produced more dual gestures while speaking L2 English than while speaking L1 Arabic. (See section 4.3.4).

This result is also in line with findings from Gullberg's study (1998). In her study, she found that L2 learners with low proficiency used gesture as a compensatory tool in order to overcome problems in communication, as discussed in section 2.5.1.1.1. In this study, Arabic early learners of English also used gesture in order to overcome communicative problems. Specifically, they used significantly more dual gestures while speaking L2 English than while speaking their L1 Arabic. This increased use of dual gestures while speaking L2 might be due to their low proficiency level in English. For example, instead of telling the listener in speech that there were two characters that performed the action, and they did not have the access to the required lexis, they extended two fingers in a path gesture as a solution.

This result is also in line with previous findings (Marcos, 1979; Jungheim, 1995a; Kita, 1993; Nobe, 1993) that the gesture rate increased in L2 due to the compensatory use of gesture as encoding problems were higher in L2. In the current study, the L2 English learners' dual gesture rate was higher in L2 English than L1 Arabic. This perhaps was caused by using gesture to compensate for speech. As they are early English learners, the difficulty of L2 production was higher.

This result is also consistent with Kendon's (1994) argument, in which he highlights one of the ways in which gesture contributes to speech. For example, even when the L2 speakers in this study used the pronoun *they* to refer to the two characters, they sometimes extended either two fingers or used both of their hands in order to indicate that there are two characters, which added an additional piece of information not expressed in speech. Thus, the speakers used every possible means including their gestural repertoire as strategies to communicate more information to their native English interlocutors.

This result is compatible with the prediction that as they are early L2 learners, they experience higher communicative demand in gesture, and as a result, they will try to make their gestures as informative as possible. This makes this result also compatible with Gerwing and Bavelas (2004)'s study, in which they found that higher communicative demand can make gestures more informative (see section 4.1.2.2.1).

4.4.3 Gesture space

This study also investigated representational gesture space in second language learners. A comparison between gesture space in L1 and L2 was conducted.

Chapter Three showed native Arabic speakers use larger gesture space than native English speakers. This is a feature of Arabic gestures (see section 3.3.2). This study found no significant difference between gesture space in early Arabic learners of English while speaking L1 and L2 (see section 4.3.5). It seems that these speakers have maintained the same gesture space feature of their gestural repertoire while speaking a second language.

Perhaps, this means that these speakers used their first-language gesture feature to communicate. They used this feature while speaking the target language because of their low proficiency level in L2. Although the prediction was that they would produce larger gestures because they are under higher communicative demand, which would be compatible with Gerwing and Bavelas (2004), this finding does not contradict with the hypothesis; Even though their gestures maintained almost the same size as their gestural repertoire and not a smaller gesture space, the Arabic speakers' gestures are already quite large, so there may not have been much room for making them even larger (see section 4.1.2.2.2).

4.4.4 Gesture rate

Descriptive statistics showed that the Arabic early learners of English produced a higher rate of representational gestures while speaking L2 English while speaking their L1

Arabic. This might have been driven by the communicative demand to gesture, which was higher during their L2 English speech (see section 4.1.2.3).

However, this difference was not statistically significant. This could be explained by the following points. First, higher gesture rate is a feature of Arabic gestures, as it was established in Chapter Three. Second, perhaps their high gesture rate is the maximum these speakers could ever reach. This means that this high gesture rate does not go higher even if they are early L2 learners who are having difficulty to communicate.

Perhaps maintaining the high gesture rate feature of their L1 while speaking L2 in this study is the effect of two factors; being under higher communicative demand to gesture and learning a low-gesture-frequency language. The former is affecting them to produce more gestures. The latter is affecting them to acquire this low-gesture-frequency feature of their L2. It seems that these two forces are working against each other at the same time. On the one hand, higher communicative demand is pushing the speaker to produce more gestures. On the other hand, learning a language with lower gesture rate is perhaps making the speakers produce fewer gestures.

This result could be considered to be compatible with Gullberg's (1998) finding regarding increased gesture rate with low L2 proficiency. In her study, she found that L2 learners with low L2 proficiency produced more gestures while speaking their L2 than while speaking their L1 due to the compensatory use of gesture. In other words, these learners used gesture as a compensatory tool due to communicative shortcomings (see section 2.5.1.1.1).

Although the difference between the learners' gesture rate in L1 and L2 in this study was not significant, descriptive statistics showed that their gesture rate was higher in L2. In this regard, these early L2 learners might have used gesture as a compensatory tool to overcome communicative obstacles. For example, some of these learners used gesture to make a shape of a character if they did not have access to the right lexis, as in *triangle*. One

178

possible reason for the non-significant difference could be the fact that their L1 Arabic is a high-gesture-frequency language. It is possible that this rate was about the most these speakers could produce. So, it was not easy to substantially increase the gesture rate in L2.

This result is not compatible with Gullberg's (1998) finding regarding gesture rate and low L2 proficiency. It has been discussed that one of Gullberg's (1998) findings is that L2 learners with low L2 proficiency produced more gestures while speaking their L2 than while speaking their L1. This incompatibility may be caused by the above-mentioned second factor: learning a language with lower gesture frequency.

Effect of L2 on L1

This study compares gesture features in L1 Arabic and L2 English of Arabic early learners of English. However, based on previous studies (Brown, and Gullberg, 2008; Wing Chee So, 2010; Brown, 2008), the distinction between gesture features of the speakers' L1 Arabic and L2 English in the current study might not be clear-cut. It might not be as sharp as the difference between gesture features of monolingual Arabic and monolingual English speakers. This is discussed further in relation to the results in the following paragraphs.

One of the key findings in this study, as mentioned earlier, is with regard to the percentage of gestures conflating manner and path. Arabic early learners of English produced more conflated gestures while speaking their L2 English than while speaking their L1 Arabic. According to previous studies such as Brown, and Gullberg, (2008, 2010), Wing Chee So, (2010) and Brown, (2008), who found an influence of L2 on L1 speech and gesture, the Arabic speakers' knowledge of English might have influenced their L1 Arabic speech and gesture. Their L1 and their L2 are typologically different languages. In other words, they come from a verb-framed language background, which is Arabic, and they are learning a satellite-framed language, which is English. This might have affected the purity of their L1

Arabic. This means that they might have started establishing monolingual English patterns in conceptualizing and expressing manner and path in motion events in their speech while speaking L1 Arabic. As a result, if their speech is influenced by their L2 speech, then gesture would be influenced by that as gestural packaging of motion is affected by speech packaging of motion (Kita et al., 2007).

The assumption that L1 Arabic might be influenced by the speaker's knowledge of L2 is based on Brown and Gullberg (2010), who found that the L1 of the Japanese learners of English was affected by their L2. Their speech path expressions started to differ from those of Japanese monolingual speakers. Also, they showed an influence of their L2 (English) on their L1 (Japanese) in gestural manner expressions. While speaking L1, their manner gestures started to demonstrate an influence of English in showing more of English specific features such as manner modulation, and less of Japanese specific gesture features such manner fog. This means that these Japanese speakers' knowledge of English has affected the purity of their L1 speech and gesture.

This could also be the case in the current study. The Arabic speakers' knowledge of English might have affected the purity of their L1 Arabic speech and gesture. Perhaps, on the continuum of language typology, their L1 Arabic would be moved further away from the verb-framed language end towards the satellite-framed languages end. This means that if their Arabic expressions of manner and path in motion events are compared to those of monolingual Arabic speakers, they might have had a greater tendency towards conflating manner and path in speech and gesture.

Since the Arabic speakers in this study are at the early stages of learning English, the borders between conceptualizing elements of motion events in their L1 Arabic and L2 English in the minds of these learners might not as sharp as the borders between conceptualizing motion events by monolingual Arabic and monolingual English speakers.

This may explain why the significance in the statistical difference between the percentages of conflated gestures in L1 Arabic and L2 English is only marginal. Accordingly, if these speakers had intermediate knowledge of English, it is assumed that the difference between the percentage of conflated gestures produced while speaking their L1 Arabic and their L2 English might be even smaller and not significant.

Dual gestures

The Arabic speakers' knowledge of English might have also influenced their dual gestures while speaking their Arabic L1. This is also based on studies of Brown, and Gullberg, (2008, 2010), Wing Chee So, (2010) and Brown, (2008), which showed influences of L2 on L1. This is explained in the following section.

Gesture space

Gesture space could have also been affected by the Arabic speakers' knowledge of English. It has been established in Chapter Three that one of the Arabic gesture features is being large and prominent, especially when compared to English gestures. In this study, it has been seen that the difference between the use of gesture space while speaking their L1 Arabic and while speaking their L2 English was not statistically significant. One possible explanation for this result is that it might have been caused by the speakers' knowledge of English, based on Brown and Gullberg's study (2008, 2010). They found that there was an influence of the speakers' knowledge of an L2 on their L1. Perhaps, in the current study, the speakers' L1 Arabic is not as pure as the Arabic of monolingual Arabic speakers. As they are learning a language of considerably smaller gestures when compared to their L1, they are beginning to produce smaller gestures even while speaking their L1 Arabic. Thus, their use of gesture space was similar while speaking both languages.

Gesture rate

The Arabic speakers' knowledge of English might have also influenced the gesture rate of their L1 Arabic. This assumption is based on previous studies such as Brown, and Gullberg, (2008, 2010), who found that the L1 of the Japanese intermediate learners of English was influenced by their knowledge of L2 English. This influence was even more obvious in gesture. This means that their L1 was not as pure as the L1 of Japanese monolingual speakers.

It has been seen in Chapter three how Arabic is high-gesture-frequency language especially when compared to English. In this study, the difference between gesture of the Arabic learners of English while speaking their L1 Arabic and while speaking their L2 English was not statistically significant. One of the reasons that might explain this result is the influence of the speakers' knowledge of a low-gesture-frequency language (English). Perhaps their L1 Arabic is influenced by this knowledge. The speakers here might have started to pattern like monolingual English speakers with regard to gesture rate. As a result, the borders between gesture rate in the Arabic early learners of English while speaking L1 Arabic and while speaking L2 English are not clear-cut, which created the above-mentioned result.

Accordingly, this result seems to be compatible with the gesture rate result from Wing Chee So's (2010) study. In this study, it was found that the L1 of Chinese learners of English was influenced by their knowledge of American English. They produced a higher gesture rate while speaking their L1 than the gesture rate of monolingual Chinese speakers.

The current study along with previous studies like of Brown, and Gullberg, (2008, 2010), Brown, (2008), and Wing Chee So, (2010) contribute to discussion of L2 influence on L1. This influence is not simply the effect of L2 knowledge on gesture features. However,

182

such change in L1 speech or gesture indicates that there is more going on. These changes signify the interaction between the two languages within the minds of L2 learners. Perhaps, as a result of learning a new language, their L1 becomes a new language with its own specific features in conceptualization, speech and gesture that is different than the monolingual version of that L1.

4.4.6 Limitations

The difficulty in coding early L2 learners' speech was a problematic issue. This is because they had limited lexical as well as syntactic resources in L2. Three speakers code switched. They used Arabic words as a solution for their inability to access the required lexical items. Their speech also contained many grammatical mistakes such as not including a verb or wrong use of prepositions.

This problem was resolved by taking into consideration their very low language proficiency while coding speech. This example may make the situation clearer. In example (11), the expression of manner and path was considered a conflation, where the speakers conflated both manner and path into one clause.

Example (11)

Tamatim go in the circle down in the beach

However, it was necessary to code such early language learners. Otherwise, this study would not have contributed to the literature how manner and path are expressed in early L2 learners.

4.5 Conclusion:

This study investigated speech-accompanying gestures in early L2 learners. This was accomplished by comparing between speech-accompanying gestures in Arabic early learners of English in terms of expressing motion events, dual gestures, gesture space and gesture rate.

It was found that early L2 learners tended to follow thinking for speaking patterns in speech and gestures in expressing motion events. It was also found that Arabic early learners of English used more dual gesture while speaking L2 perhaps due to the higher communicative demand situation they were in. It was also found that they used their first-language feature of gesture space, which is already large and expansive.

Chapter Five: Discussion and Conclusion

The aim of this research project has been to examine the properties of gesture in the light of factors which shaped these gestures in first as well as second language speakers. The ways in which culture and language have shaped the production of certain gesture features have been investigated. This was accomplished by conducting two empirical studies: a cross-cultural and cross-linguistic study, and a second language study. The findings arising from this research project and its contribution to the literature are discussed here in detail.

5.1 Cross-cultural study

Research into Arabic gesture is presently considered limited. As such, this research project constitutes a significant contribution to the extant literature on Arabic gesture by providing more detailed descriptions of gesture in Arabic speakers, and by demonstrating quantitative reliability. This research project highlights and investigates certain features of the gestural repertoire of Arabic speakers.

The first study was performed to investigate features of gesture in a cross-cultural comparison. The differences in gesture between English and Arabic were examined in relation to the following four areas: expressing motion events, dual gestures, gesture space, and gesture rate. Findings of this study answered the research questions that were raised at the beginning as follows. They are discussed in the following paragraphs highlighting their importance in a larger scale.

This cross-cultural study contributes to theoretical debates such as the relationship between language and thought and cross-cultural communication. Its contributions to the argument of the relationship between language and thought is discussed in the following paragraphs.

Speakers coordinate the use of gestures together with speech for the purpose of expressing thoughts (McNeil, 1992). These two communicative channels work together in an integrated system to convey meaning. Language is expressed by the two modalities (ibid). This research project contributes to the existing ongoing discussion of the relationship between language and thought. It investigated the effect of language on gesture through thought with respect to two theories; thinking for speaking and habitual thinking. These are discussed next.

The phenomenon of language influencing thought is evident in Slobin's (1996) Thinking for speaking theory, which was discussed in detail in Chapter Three in section 3.1.1.1. It was also seen how gesture expresses motion events in a similar way to which they are typically expressed by language (Kita, & Özyürek, 2003) (see section 3.1.1.1). This reflects the thinking for speaking theory (Slobin, 1996; Kita, & Özyürek, 2003) and, therefore, the effect of language on thought.

In this study, it was found that the English speakers typically conflated manner and path within one clause when both were mentioned in speech. In contrast, it was found that the Arabic speakers typically separated manner and path in two clauses, leading to the conclusion that Arabic is a verb-framed language. It was also found that the English speakers in this study typically produced more gestures conflating both elements, manner and path, as anticipated by the findings of Özyürek, and Kita (1999) and Kita, and Özyürek (2003). Furthermore, this study is the first to document the way in which Arabic speakers gesturally express manner and path. If manner and path were expressed simultaneously in speech it was found that Arabic speakers typically represent them using separate gestures (see section 3.3.1). This gestural expression of manner and path is a reflection of the typology of the speech syntactic packaging of the spatial components in the above-mentioned languages, which is reflected in Thinking for Speaking patterns (Kita, and Özyürek, 2003; Slobin, 1996).

The present study is not the first to provide gestural evidence for typological patterns of thinking for speaking. The results of the study do, however, contribute to the discussion through its investigation of Arabic language typology in expressing motion events, and its exploration of the way this is mirrored in gesture.

Significantly, though, language influences thought beyond thinking-for-speaking, as stated in the Whorfian hypothesis, which proposes that language establishes habitual patterns of thought which appear even if the related linguistic elements are not present in speech. Gesture accompanying speech is one of the tools employed to reveal this effect. McNeil and Duncan (2000) point out that "By virtue of idiosyncrasy, co-expressive speech-synchronized gestures open a 'window' onto thinking that is otherwise curtained. Such a gesture displays mental content, and does so instantaneously, in real time…".

The present study contributes to the overarching debate on language and thought by providing gestural evidence for Whorfian theory. A significant difference was found between English and Arabic in the use of dual gesture. Arabic speakers produced more dual gestures while describing dual events than did English speakers (see sections 3.3.2).

In the current study, subjects speaking informal Arabic made use of dual gesture, despite the fact that dual-ness was not syntactically expressed in their speech. This seems to suggest the influence of the grammatical dual form common in standard Arabic upon them. The dual gestures of the subjects appear to evince habitual thinking in a dualistic mode brought about by contact with standard Arabic. This would appear to demonstrate a potential impact of language upon thought.

The evidence this study provides for gestural evidence for habitual thinking might be more convincing than other studies. While it has been claimed that the use of absolute frame of reference by speakers of Guu Yimithirr, an Australian aboriginal language (Haviland, 1993; Levinson, 2003), was a Whorfian effect (Majid et al., 2004), an alternative explanation

was put forward suggesting that it might also have been a result of ecological factors such as arrangements of buildings, noisy streets and activities being held there. As such, the evidence provided by the current study is somewhat more compelling, given that there appears to be no alternative explanation (ecological or otherwise) for the phenomenon of dual gesture in non-dual linguistic modality other than language influence.

In communication, a message is not only delivered through speech, but also through the use of gesture. The two modalities work together to express meaning (McNeil, 1992), and gesture constitutes an essential part of multi-modal communication (Kendon, 2004).

The findings from this study seem to have implications for cross-cultural communication. People from different cultures, who do not share a common language, often succeed in communicating (Jandt, 2012). Various factors can bring them together, including tourism, business, politics, immigration or receiving visitors (Jandt, 2012; Bochner, 2013). It was previously demonstrated that gesture differs cross-culturally for a variety of reasons. Diverse cultures exhibit a range of gestural behaviors, the interpretations of which also differ cross-culturally. Such differences can lead to misinterpretation, which can constitute a barrier to communication. If speakers do not share the same gestural behaviors, inappropriate use of gesture can lead to misunderstanding. A gesture in one culture can be innocent, while in another be considered insulting (Jandt, 1998). For example, the use of the left hand for pointing in Ghana is considered a taboo and impolite, whereas it is acceptable in other cultures such as that of North America (Kita, and Essegbey, 2001). Thus, gesture use influences intercultural communication (Jandt, 1998).

In order to achieve effective intercultural communication, it is necessary for speakers and listeners to acquire verbal and nonverbal communication skills (ibid). This involves furthering their understanding of cross-cultural differences regarding gesture.

The current research project provides quantitative and detailed qualitative descriptions of gesture use in two diverse cultures, English and Arabic. The study provides information on certain properties of gesture produced by speakers from these two cultures. It also draws the reader's attention to the factors that have shaped these gestures, which adds a deeper dimension to the understanding of gesture in these cultures.

Further, the study provides new knowledge regarding gesture space and rate in Arabic speakers. It reveals that Arabic speakers generally use considerably larger gestures, and produce a higher gesture rate, compared to speakers from a Western culture (in this case, English). For example, if speakers from these two cultures attempt to communicate and do not possess the necessary information regarding the gesture features of their respective cultures, the English speaker may think that the Arabic speaker is being rude and loud because of the large and numerous gestures that he/she is employing; in contrast, the Arabic speaker may consider the English speaker cold and reserved as a result of their relatively limited gesture use.

However, if speakers can perceive and acknowledge the disparities in these culture-specific gesture features, the chances of misinterpretation during communication are decreased. Being communicatively competent results in better interaction across cultures (Jandt, 1998).

5.2 The second-language study

A second-language study was developed on the basis of the cross-cultural and cross-linguistic study described in the preceding paragraphs. Available literature on the topic seems to suggest that many second-language gesture studies have focused on gesture use by intermediate and advanced second language learners, whereas gesture use in the early stages of language learning has tended to be neglected.

The early stages of learning merit study because gesture seems to play a considerably important role in communication and cognition when the speaker has limited lexical and syntactic resources available to them through speech (Gullberg, 1998; 2006). As such, this research project sought to contribute to the current research into the gesture properties of second-language learners by highlighting the features of gesture in early second language learners described below.

Gesture features of Arabic early learners of English were investigated through a comparison of speech-accompanying gesture in the first and second languages of speakers in terms of expression of manner and path, dual gestures, gesture space, and gesture rate.

It was found that early second-language learners tended to grasp target-like thinking for speaking patterns while expressing motion events in L2 in speech, but in gesture, they did not reach that point completely. During L2 speech, Arabic early learners of English were more likely to express manner and path within a single clause. Further, they were more likely to conflate manner and path into a single gesture when both were mentioned. However, within their L2 English, they tended to separate more than conflate those gestures.

Another finding was that gesture in early second-language learners is more informative when they are speaking in L2. This was evident in the way in which speakers used their gestural repertoire to communicate additional information. While it has been observed that native Arabic speakers employ more dual gestures than do native English speakers, Arabic learners of English also used more dual gestures when speaking L2 (English) than when speaking L1 (Arabic). This tendency might become more pronounced when speakers are in a situation of high communicative demand.

It was also found that Arabic early learners of English utilized the same-sized gesture space when speaking their second language as they did when speaking their first language. It

191

is suggested that this gesture feature might have transferred into the L2 gestural repertoire for effective communication.

Gesture accompanying speech can be used for the purpose of assessing second-language proficiency in second-language learners. Gestural competence can be used as a sign of communicative competence in second-language learners (Canale, and Swain, 1980; Neu, 1990). This was observed in a study by Neu (1990), in which second-language proficiency of a Saudi Arabian and a Japanese second-language learner was compared through interviews for the purpose of assessing their communicative competence in L2. It was found that even though the Japanese learner was better in communicating verbally in L2 than the Saudi Arabian learner, the Saudi Arabian learner was judged to have more communicative competence than the Japanese learner due to their use of facial expressions, non-verbal body movements and arm and hand gestures.

This research project sheds light on properties of gestures in early second-language learners. These features can be used as a sign for assessing second-language proficiency in second-language learners. It was assumed that learners with similar gestural patterns as exhibited by the second-language learners in the dataset in this study would be of low language proficiency and would therefore exhibit a low degree of communicative competence in L2.

Gesture in second-language learners plays a significant role in communication, as has been discussed in Chapter Two in section 4.1.2.1 (Gerwing, and Bavelas, 2004; Kida, 2005). As such, the exclusive use of audio recordings of the L2 speech of second-language learners might not be adequate for the purpose of assessing their communicative proficiency. Kellerman (1992) points out that gestures are important for L2 listening comprehension. The rating of proficiency in second-language learners through both audio recordings and face-to-face communication was examined in a study by Nambiar, and Goon (1993). It was found

that proficiency assessments during the face-to-face interaction produced significantly higher ratings than via audio recordings, likely because the use of gesture and other non-verbal behavior rendered negligible the linguistic errors that they made.

This study also recommends such face-to-face interaction with second-language learners, in particular beginners, because this can best facilitate understanding. For example, dual gestures in this research were used by second-language learners as a strategy to communicate the concept of dual-ness to their interlocutors. Even if the thought is not verbally expressed, it is communicated through gestures (McNeill, 1992).

The use of more expressive gestures by teachers in a classroom setting can effectively assist learners' comprehension. This was investigated in a study by Lazaraton (2004), who found that illustrative gesture use enhanced the ability of learners to distinguish between words and to comprehend new vocabulary.

Dual gestures seem to be informative and expressive by nature, as has been explored earlier (see section 3.3.1.7.2). It might be useful for teachers of Arabic to employ such gestures in a classroom setting to introduce new lexes that relate to the concept of dual-ness. Using them in teaching may enhance the comprehension of learners concerning vocabulary related to this topic.

5.3 Study challenges

As with any research, the present study has faced a number of challenges including unavoidable limitations, such as the differences in culture between the societies from which the participants originate as well as the setting of the experiments. These limitations are discussed below.

One of the main challenges faced during the data collection process related to an element of Saudi Arabian culture and society relating to gender. It is common practice in Saudi Arabia for men and women to be segregated when outside the home. This practice of

gender segregation starts at a very early age, whereby primary school-age children are segregated and throughout education until they graduate from university[3]. Even following graduation, when Saudi men and women enter the work force, companies also adhere to the country's segregation law. Due to the same-sex environment in which Saudis are raised, it is therefore not uncommon for men and women to feel shy and awkward when interacting with the opposite sex. This might have a direct effect on gesture production in the two studies; for example, gesture rate might increase or decrease, which could inject bias into the results of the study since gesture rate is one of the variables under investigation.

Another challenge emerged from my attempts to conduct the experiment in Saudi Arabia. Female universities in Saudi Arabia rejected my request to carry out studies on campus. Due to the nature of the study, video recording was an essential element of data collection, and as a result of this, carrying out the study in an all-male college would have been considered taboo. To overcome this practical challenge, it was decided to carry out the study in the United Kingdom, with both male and female Saudi students included as participants. This enabled me to conduct the experiment freely, with the participation of people of both genders, and without the constraint of societal complications. The possible influence of L2 on L1 has been discussed in the Effect of L2 on L1 section in Chapter Three and in Chapter Four.

However, although no longer living in Saudi Arabia, many of the participants continued to operate according to the social mores of Saudi Arabia when interacting with members of the opposite sex. This was particularly apparent with students who had recently arrived in the United Kingdom. As such, the decision was made to employ a male interviewer for the male participants and a female interviewer for the female participants, thus reducing

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[3] All schools and universities in Saudi Arabia abide by the gender segregation law except for some medical colleges that allow mixed gender courses due to the nature of their future careers.

the awkwardness experienced by the participants, minimizing the resulting influence on gesture production, and ensuring unbiased results.

The greatest strength of this research project is that it focused on eliciting spontaneous gestures from participants. Subsequent analysis of the data, however, necessitates the use of video recording throughout, and the presence of a video camera can create an inherently unnaturalistic environment for the participants, thus running the risk of influencing their responses and biasing the results.

5.4 Future possibilities

A number of considerations arising from the present research project offer a range of fruitful areas for future study. Further investigation into Arabic gesture would be an important first step. In addition to focusing on two different languages, it would also be enlightening to compare features of speech-accompanying gesture in speakers of two different dialects within Saudi Arabia. Specifically, it would be useful to compare speakers of the Hijazi dialect from the western region of Saudi Arabia with those of the Najdi dialect from the central region. This is because there are cultural differences between speakers of these two dialects. These differences might be due to the fact the area of Hijaz has more cultural diversities than the area of Najd. Therefore, Hijazi inhabitants are more in contact with people from different cultural backgrounds. As mentioned earlier, cultural interaction might participate in shaping their gestures (see section 3.1.3). Such a comparison could be carried out using a very similar methodology to that employed in the present research project.

Furthermore, dual gesture requires further investigation- specifically, into dual gestures of speakers of languages which still use the dual grammatical form in their everyday speech. The research methods employed in the present study would be appropriate for such a

study because of the efficacy of its design, which is aimed at eliciting the concept of duality in speech and gesture.

The results of the present study highlight the potential value of studying the frame of reference used by nomads in Saudi Arabian deserts when describing directions and locations, as with the studies of Haviland (1993) and Levinson (2003). This could assist in our understanding of whether the Absolute frame of reference by speakers of the Australian aboriginal languages as described in the present study is shaped by the people's ecology and nomadic lifestyle or indeed whether the phenomenon is a Whorfian effect. If nomads in the Saudi Arabian desert gesturally refer to directions and locations using the Absolute frame of reference even if it is not used in speech, then it can be concluded that the greater influence is that of ecology and the nomadic desert lifestyle. If not, then it can be argued to be a case of habitual thinking predicated on language use.

A final recommendation would be a study of the frame of reference used by Arabic learners of English. The first and second languages of Arabic learners of English possess different writing systems: Arabic uses a right-to-left writing system, whereas English uses a left-to-right writing system. It would therefore be interesting to see how this is reflected in the gestures of these learners as they speak L2.

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