GESTURE AND RHETORICAL DELIVERY: THE TRANSMISSION OF KNOWLEDGE IN COMPLEX SITUATIONS

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by

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CHAPTER 1

Introduction

Human communication exists in many forms. We speak, gesture, write, play music, dance, and paint. These and other modes, that is the manners or ways through which we communicate, are represented through a wide variety of modalities (or media), such as books, telephone, the Internet, and face-to-face communication.[1] Increasingly, we use and rely on ever more complex technologies to transmit communication over long distances, often in real time. In my study, I focus on the use and role of gesture in human communication for the representation of embodied knowledge. The discussion does not focus on gesture from a communicative perspective, for example, involving issues such as gesture and inter-human relations, gesture and culture, or gesture and gender; or from a perspective of Gesture Studies but rather from a rhetorical perspective. Accordingly, I view gesture as an element of delivery, and, consequentially, treat delivery as one of the five canons of rhetoric.

In early treatises on rhetoric, authors such as Aristotle and Quintilian identified delivery as one of the five canons of rhetoric alongside invention, arrangement, style, and memory. As they describe it, the canon of delivery involves bodily expressions, namely

[1] I differentiate mode and modality from semiotic as a sign system. I use semiotic to discuss Halliday's theory and its extensions (see Chapter 3) but believe that the term is too much based in print linguistic considerations and therefore prefer mode and modality for my study.

voice, gesture and facial expressions. While Aristotle argued that delivery, and with it gesture, was merely a distraction from the argument a rhetor made, Quintilian and Cicero felt that delivery contributed to the speaker's argument only to the extent it affected the audience's emotions. This attitude, considering delivery as primarily ornamental rather than argumentative, remained popular throughout the Elocutionary movement with authors such as Austin, Bulwer and Sheridan. Only recently, during the second half of the 20th century, have scholars in Gesture Studies, such as Kendon, McNeill, Goldin-Meadow, and Alibali begun to acknowledge that gesture plays a much more crucial role in human communication than commonly held. They argue that speech and gesture have to be considered equally important and that gesture, speech, and thought form a unit. Consequently, in academic circles, gesture is no longer understood as merely ornamental but as part of the force of an argument.

While a shift has occurred in understanding gesture's role in human thinking and communication, the study of gesture remains divided into two camps—rhetorical and Gesture Studies. Current research in rhetoric has considered delivery in the abstract sense, for example, (1) that it represents and connects human thought and communication media[2] and (2) and that it functions as a masculine canon (Buchanan, Mattingly); as such, rhetoricians, for the better part, disregard gesture's role as an element of delivery. In the meantime, researchers outside the field of rhetoric, Gesture Studies especially, are exploring the role gesture plays in human communication. To ameliorate this divide

[2] Newman (2009) has considered gesture and delivery and its marginalization from an argumentative stance.

between Gesture Studies and rhetorical studies of delivery, my research reintroduces gesture into the rhetorical study of delivery.

Recent research in the field of Gesture Studies has provided significant new insights into gesture's uses and roles in human communication; rhetoricians should take notice. Human communication is not only multimodal (i.e., humans employ different modes and modalities in communicative acts) but scholars also cannot simply focus on one mode without compromising how we understand the meaning of the message. Therefore, my study asks the questions: How is gesture used, and what is its role in the representation of embodied knowledge?

Research has not yet identified how humans transmit embodied knowledge in complex environments[3]. In other words, we know that lay people are able to learn from experts and in turn are able to develop expert knowledge over time; however, we do not yet understand how this knowledge transfer occurs and which modes play what role in it. This gap is due in part to a significant circumstance: because embodied knowledge is not consciously accessible, it is difficult to evaluate and communicate about it. One way to circumvent this problem is not by studying embodied knowledge directly but by observing embodied practices. I understand and treat embodied practices as the actualization of embodied knowledge as it is realized through bodily actions, including gestures and facial expression, in real time and space, and in specific situations.

[3] When using the terms "complex environment" and "complex situation," I am referring to environments and situations in which humans employ multiple modes and modalities, rather than environments solely comprised of print linguistic materials. I furthermore acknowledge that human communication is primarily multimodal rather than print linguistic.

Current understanding of human communication has changed dramatically over the years; especially within since the 1990s, scholars study communication as a multimodal event. Since the advent of mass printing technologies in the 18th century, however, the print linguistic mode has been privileged in popular and academic circles, even to the extent that communication was often studied as a monomodal event. In the 20th century, this approach slowly shifted as researchers included images, sounds, and other modes into their studies. Scholars across various disciplines now acknowledge that human communication involves multiple modes and modalities at any given time. Despite understanding that human communication takes place in complex multi-semiotic environments, only scant attention has been paid to gesture.

With all the insights that come from the field of Gesture Studies, scholars should include gesture in multimodal studies of communication and, at the same time, reconsider gesture as an element of delivery. Accordingly, I argue that understanding how gesture functions will help us better understand how humans represent embodied knowledge in complex multimodal situations, as, for example, the one I have studied here, an instructional massage therapy environment. I believe that gesture is a key element in the representation process and that the transmission and acquisition of embodied knowledge would be far less efficient without gesture.

Accordingly, my dissertation (a) returns gesture to rhetorical studies of delivery by acknowledging gesture as a mode of delivery which facilitates human communication, and (b) expands efforts to understand embodied human (inter)action and knowledge

representation in complex multimodal environments vis-á-vis rhetorical delivery, focusing on the use and role of gesture.

Current questions that define my research are:

- With a specific focus on gesture, how does delivery contribute to the representation of information between humans in complex environments?
- How do gesture and speech cooperate to represent complex information?
- Do current taxonomies fully account for the ways in which we currently understand the use of gesture?

As my dissertation shows, recognizing the role gesture plays in human knowledge representation allows me to argue (a) delivery plays a more significant role in human communication than currently acknowledged and that (b) that gesture plays a crucial role in the representation of embodied knowledge.

In my study, I do not focus on gestures in general but more specifically on what I call "touch gestures." The majority of studies concerned with gesture have focused on mid-air gestures. In contrast to touch gestures, mid-air gestures do not incorporate objects or bodies as an essential component of the gesture. In other words, touch gestures only reach their full meaning-making potential through the inclusion of objects or bodies. Incorporating the touch sequence in the gesture is essential to the meaning-making process the gesture performs. While researchers acknowledge the fact that humans produce gestures that include objects or bodies, little research explores the phenomenon. By extension, this gap also means that current gesture taxonomies are primarily based on the observation, study, and analysis of mid-air gestures. In addition, current gesture

taxonomies often study gestures in experimental lab settings or participants narrating a (cartoon) story. For me, this raises a significant question: Are these taxonomies applicable to touch gestures, and will I have to or can I extend them to also apply to touch gestures? In addition, I must demonstrate what touch gestures can teach us about gestures as well as delivery that mid-air gestures cannot.

To support my argument, I have collected data, print linguistic, verbal, and visual, in the instructional environment of a massage therapy program at a small Midwestern college, through observations, videotaping, and collecting of print materials followed by transcription of speech and gesture. As later chapters detail, I videotaped students and instructors during multiple class sessions of a massage therapy course that is part of the basic requirement for all students within the massage therapy degree program. The class is a mixture of traditional lecture style and hands-on demonstration and practice. During the lecture, students sit in rows, oriented toward the front of the classroom. The instructor, facing the students, is in charge of the majority of what is said and done in the class. Students join in with questions or comments. During hands-on sessions, the students are much more actively involved in the events in the classroom through both speech and bodily behaviors, such as massage practice than during lecture parts of the lessons. Given the circumstances of the situation, my focus is almost exclusively on the instructor during the lecture parts of the class; and while I still focus on the instructor during the hands-on situations, I also recorded more student-student and student-instructor interactions.

According to each classroom situation, different modes and modalities are employed. During lecture sessions, print linguistic materials (textbooks, PowerPoint presentations, whiteboard) and accompanying speech are predominantly used. During hands-on sessions, speech and gestures dominate the instruction. My study explores how the use of gestures changes in these different instructional contexts and the extent to which these gestures contribute to the representation of (embodied) knowledge within these situations.

To answer my research questions, I first reevaluated the ways in which speech and gesture are currently transcribed. This process included both how gestures themselves are transcribed and how the joint function of gestures and co-occurring speech is handled. Current transcription conventions are often heavily text based and do not consider the visual aspect of the mode of gesture. But, technologies now allow us to transcribe gesture visually through the use of stills taken directly from video recordings. I believe that my visual transcription conventions for gesture and speech allow me to transcribe complex interactive situations in ways that enable the reader to understand the interaction in writing as if it were happening in real life.

I study gestures by first reappropriating Halliday's theory of systemic functional linguistics (SFL) and its extensions into the realm of multimodality. Then, I use Mediated Discourse Analysis, as proposed by scholars such as Norris, Jones, Scollon and Scollon, as a heuristic tool to connect and extend discourse analysis and link it with taxonomies and methodologies employed in gesture study.

Thus, my analysis of gesture departs from current gesture taxonomies, prominently those developed and introduced by Kendon and McNeill. Based on my methodology, I first identify gesture types as they have been acknowledged in current taxonomies, namely signs, speech-linked gestures, emblems, pantomime, and gesticulation (including the subtypes iconic, metaphoric, deictic, and beat). Then, I discuss types of gestures I observed that are similar yet different from currently acknowledged gesture types. Finally, I identify new gesture types that appear nowhere in the literature.

Perhaps not surprisingly, my discussion then focuses on those gesture types that have not been acknowledged, namely tapping, counting, deictic-iconic, and modeling. I describe these gestures' form and function, detail their relationship with speech, and link them to the rhetorical canon of delivery. Finally, I detail how these gestures contribute to the transmission of embodied knowledge. In so doing, my work sheds light on the ways in which experts communicate knowledge to students in various stages of acquiring embodied practices.

To those ends, Chapter 2 provides an overview of existing literature, linking gesture, rhetorical delivery, and embodied knowledge. In Chapter 3, I discuss the theoretical and analytical frameworks, which support my inquiry and offer my methodology developed form those frameworks. I extend Halliday's SFL and its extensions into multimodal studies. More specifically, through the help of the heuristic tool of Mediated Discourse Analysis, I link methodologies and taxonomies from the field of Gesture Studies to study gesture accordingly. Subsequently, Chapter 4 details my data

collection, focusing on participants and introducing the study of massage therapy. In Chapter 5, I present my findings. Specifically, I locate observed gestures in current gesture taxonomies. I then detail gestures that are variations of those gesture types, and, finally gestures that are at present unacknowledged. I discuss these types in Chapters 6 and 7. Specifically, I examine tapping and counting in Chapter 6 and deictic-iconic and modeling in Chapter 7. By describing their form and function, I link them with rhetorical studies of delivery. Chapter 8 provides what I call the bigger picture: A discussion connecting gestures and other modes and modalities as students move through what Sauer (1998) calls different categories of sensory information, namely pit sense, engineering experience, and scientific knowledge. I show how participants use the affordances and constraints of different modes and modalities and how these uses change accordingly to particular situations.

My study reevaluates the role gesture and delivery have played in communication as well as the attention it has been given in recent years. I demonstrate one way in which gesture and delivery can be reintegrated into rhetorical studies, a viewpoint that emphasizes their important function within human communication, the representation of embodied knowledge in particular. Only through the human body are we able to experience the world around us and to communicate about this world to others.

CHAPTER 2

Literature Review

2.1 Introduction

As the scholarship on rhetorical delivery, Gesture Studies, and embodied knowledge concur, humans not only gesture frequently but also commonly include objects, their own body or others' bodies when gesturing. Given such agreement, my study focuses on gestures, specifically touch gestures, as they function in real time situations in which embodied knowledge is transmitted. My goal is to reintroduce studies of gesture into rhetorical studies of delivery and show what each can do for the other. Because gesture plays a crucial role in the delivery of embodied practices, a study of gestures not only furthers our understanding of embodied knowledge but also emphasizes gesture's importance in human communication; gesture and delivery need to be re-integrated into rhetorical studies. Because gesture is in this sense more than ornamental, this integration and reintroduction will also contribute to a better understanding of the way delivery informs rhetorical practices.

I discuss delivery within the context of the five canons of rhetoric, namely invention (*inventio*), arrangement (*dispositio*), style (*elocutio*), memory (*memoria*), and delivery (*actio* or *pronuntiato* in classical Roman rhetoric, and *hypokrisis* in Greek). For classical Greek and Roman rhetors, as well as the majority of the history of rhetoric,

delivery is composed of gesture, voice, and facial expressions, and therefore focuses on the bodily aspects of oratory[4].

With the advent of print linguistic communication, memory and delivery disappeared more and more from rhetorical instruction and scholarship on it. Welch (1993) argues that "the reliance of writing pedagogy on textbooks [has] truncate[d] the five canons from five to three, so that invention, arrangement (form), and style repeatedly colonize the last two—memory and delivery—and then eradicate them" (p. 18). It is often argued that "writing made memory and delivery less relevant because those two canons are said to be more powerful in orally dominant cultures" (p. 19). But, Welch argues that this is not the case and that memory and delivery only "change form" (p. 19) in writing, especially after the emergence of electronic forms of discourse. Welch, following Ong (1991), argues that "we are now well into secondary orality," (p. 23) where

> The spoken word is now frequently electrified, instantaneous, repetitive, and so familiar that we take it for granted or, more usually, cordon it off into another Cartesian category out there in the world, retrievable and usable as necessary but not an inherent part of human beings. (p. 23)

Although I agree with Welch that delivery can and should be extended into the realm of (electronic) writing, I also see a problem with her argument. She indicates that a focus on print linguistic moved rhetorical scholars' attention away from memory and delivery. Yet

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[4] Although important, I do not discuss voice and facial expressions as well as the other four canons because I wish to emphasize the importance of delivery and gesture. Furthermore, cultural differences are important but are not considered here.

she focuses on electronically modified, print linguistic documents. Therefore, and as many other scholars before her, Welch marginalizes the role of gesture in rhetorical delivery. Because of the current print linguistic bias, rhetorical studies has ignored delivery and gesture (Porter, 2009; Welch, 1993, 1999). In other words, to extend delivery beyond the body, we first need to understand delivery in the context of complex multimodal environment involving the body.

These recent concerns, which inform my study, do not in fact conform to past interests. Gesture and delivery are not new topics in rhetoric. Discussions of gesture and delivery can be traced back at least to Classical Antiquity. However, the ways delivery and gesture have been regarded, and the roles they have played in human interaction, have undergone dramatic changes throughout the intervening millennia. I continue this chapter with an historical discussion, providing a historical overview of shifting conceptions of delivery and gesture from Antiquity until the present. To those ends, I discuss how gesture was once considered an element of delivery, how gesture and delivery became separated in scholarly discussions, and finally, how they are currently discussed in ways which integrate gesture and thought but not gesture, rhetoric, and embodied knowledge.[5]

2.2 Historical Discussion

Some of the oldest known and most influential Western treatises on rhetoric date back to Classical Antiquity and were written by Aristotle (n.d./1991), Cicero (55

[5] Rather than offering a separate section for defining key terms, such as gesture and embodied knowledge, I include these definitions in the appropriate sections.

BC/2001) and Quintilian (n.d./2001). These rhetoricians focused on educating orators, and to that end, discussed delivery as one of the five canons of rhetoric, along with invention, arrangement, style and memory. As they indicated, delivery is composed of gesture, voice and facial expressions. Moreover, all three authors treated delivery, including gesture, as a means of evoking emotions in the audience and essentially ornamental in nature. In other words, delivery did not inform argument. While Aristotle argued that delivery is closer to acting and thus distracts from the argument, Cicero saw value in delivery to evoke emotions in the audience. Like Aristotle, Cicero argued bodily movements, especially facial expressions, improve the speech. Quintilian developed these ideas in his *Institutio oratoria* ("The Formation of a Public Speaker"), a compendium of twelve rhetorical books. In the 11th book, he gives particular advice on memory and delivery. There, Quintilian acknowledged that voice (*vox*) and movement (*motum*), later on referred to as *gestus*, are significant for delivery; he states that "the voice has our first claim on our attention, since even our gesture is adapted to suit it" (n.d./2001, XI, III. 14). Furthermore, Quintilian argues that proper delivery can be achieved only by practicing gestures so that they appear naturally.

During the Middle Ages, scholars paid scant attention to rhetorical discussions of delivery and gesture. However, gesture itself did not lose its importance in settings where public interaction was deemed crucial. For example, as illustrated versions of the German thirteenth century *Sachsenspiegel* ("Saxon Mirror") show, legal rituals and religious ceremonies heavily relied on formalized gestural actions and bodily comportment (Amira, 1905; Dobozy, 1999).

At the beginning of the sixteenth century, the discovery of the complete works of Quintilian and unknown works of Cicero renewed practical interest in the role of gesture and delivery by practitioners. Toward the end of that century, Catholic priests as teachers, preachers, and the masters of all religious ceremonies focused on gesture in performing sermons. In other words, similar to Classical Antiquity, practitioners understood delivery's status in oratory as ornamental rather than as contributing substantially to the argument of speech. On this basis, delivery was incorporated as a systemic teaching subject in universities and schools (Kendon, 2005).

During the seventeenth century, many detailed publications on delivery appeared. Starting in the seventeenth century with John Bulwer (1644/1974), this approach to delivery culminated in the eighteenth century Elocutionary Movement. At the time, authors such as Gilbert Austin (1806/1966) and Thomas Sheridan (1762) rediscovered delivery, gesture, and their usefulness for oratory. Both Austin and Bulwer wrote treatises which try to capture and categorize all the meaningful movements, which can be made with the body to improve public delivery; at that time, citizens had to know how to speak and move properly to be accepted in the right socio-political circles. To support and visualize the object of study, such treatises were illustrated with engraved figure plates, describing gestural movement and body postures in minute detail. Later, scholars argued that this approach to gesture was a mechanical one and too far removed from naturally occurring gestures.[6] In fact, similar to the Ancient treatises, the Elocutionists held that naturally occurring gestures could be improved through art, that is, training, and are

[6] The Elocutionary texts considered facial expression and voice but the majority of their discussion and interest in delivery was on gesture.

governed by cultural conventions. Sheridan especially argues that gesture's natural appearance must be maintained, thereby allowing an orator to appear true to himself. Accordingly, gesture and delivery were still treated as ornamental rather than substantive. In addition, delivery was as yet the overall category or canon into which gesture was subsumed.

With the end of the Elocutionary Movement in the late eighteenth century, interest in gesture and delivery declined. One reason for the decline may rest in the development of mass printing and, with this, the belief that alphabetical language alone was the single most important medium of human communication (Kendon, 2005).

2.3 Gesture Studies

2.3.1 Gesture studies in the 19th century.

In the nineteenth century, scholarly focus shifted away from a combined interest in rhetorical delivery and gesture, and several independent works on gesture were published. For example, Andrea de Jorio (1832/2000) gained insights into the role of gesture in everyday expressive human communication. He studied paintings in Pompeii and discussed what the depicted gestures might mean, observing that those depicted in paintings are quite similar to those used by Neapolitans in everyday life of his time. Kendon (2005) notes that "as an ethnography of gesture and as a commentary on various methodological and semiotic issues in the study of gesture the book still has much to offer" (p. 45). For example, de Jorio argued that gestures should be studied within the complexity of an interactional situation in process because only then can their meaning

be fully understood. Furthermore, de Jorio considered gestures akin to language, although gesture "is not a language" (de Jorio, 1832/ 2000, p. 8). As such, concepts known from the study of language may be applied to the study of gesture. While Edward Tyler (1865/1964) studied symbolic communication, including Gesture Studies, in his inquiry, Wilhelm Wundt (1921/1973) advanced understanding of sign languages and semiotically classified different kinds of gestures. By the end of the nineteenth century, a number of scholars had demonstrated the significance of research into gesture. At the same time, after delivery had been ignored since the Elocutionary Movement or marginalized as mere acting or ornament, the interest in gesture became a separate line of inquiry from its study, or the study of delivery in rhetoric.

2.3.2 Gesture Studies in the 20th century.

The second half of the twentieth century experienced another revival of work in Gesture Studies. At that time, researchers considered cognitive processes and asked how they were related to language and speech. Although this line of research was separate from rhetorical studies, it is of interest to scholars of rhetoric because it contributes to our understanding of the relationship of language, gesture, and thought. The so-called "cognitive turn" was taken around 1960 by many psychologists and linguists, especially Noam Chomsky. Chomsky (1967) steered linguistics away from describing language's surface structures to analyzing language's underlying cognitive functions and apparatus. The cognitive turn also opened the door for modern Gesture Studies, which was supported in turn by the development of video technology; such technology allowed

gesture and speech to be documented and analyzed much more easily and precisely than previously.

The first study on the relation of gesture to speech was conducted by David Efron (1941/1972) and is still considered outstanding. Efron videotaped immigrants of Jewish and Italian heritage in Manhattan. He found not only that the gestures of newly arrived and more acculturated immigrants differed but also that the gestures of the more Americanized Jewish and Italian immigrants were more similar to each other. As a result, he concluded that gesture is a product of culture rather than genetics. Unfortunately, Efron never reported which language the immigrants spoke when they gestured. This detail would be of particular interest since recent research has shown that gestures are formed differently in various languages.

2.3.3 Gesture Studies since the mid 1970s.

Since the mid 1970s, anthropology, linguistics and psychology have renewed their interest in Gesture Studies. The field is defined by renowned scholars such as Adam Kendon (1997, 2000, 2005[7], 2007), David McNeill (1992, 2005), McNeill and Duncan (2000), Susan Goldin-Meadow (1999, 2005, 2007), and Martha W. Alibali (2000, 2001, 2003, 2004, 2007). Their work explores the relationship between gesture and speech as well as the role of gesture in human discourse and thought.

[7] I am primarily referring to Kendon's 2005 publication since it is the most comprehensive work he has published.

2.3.3.1 A definition of gesture.

Kendon (2005), for example, explains what sets a gesture apart from other movements people make with their hands, arms, and other parts of their bodies. He furthermore explores the different stages a gestural movement follows, defines different types of gesture, and discusses the relationship of speech and gesture. I offer an in-depth discussion below. He frames his research by analyzing historical perspectives on gesture. In addition, Kendon (2005) makes the following definitional points about gestures on which authors agree: First, gestures are regarded as a "manner of action" (p. 8), second, they are of "expressive significance" (p. 8) to the utterance, and, third, the speaker exercises a certain amount of "voluntary control" (p. 8) over his/her movements.

Through experimental research, Kendon (2005) determined that people agree spontaneously (and even without receiving any instruction) on which movements are gestures and which are not. Accordingly, Kendon (2005) next suggested that a movement is perceived as a gesture when it is a "visible action […] used as an utterance or as part of an utterance." An "utterance," then, is "any ensemble of action that counts for others as an attempt by the actor to 'give' information" (p. 7). In other words, to Kendon, an "utterance" is any action or set of actions, which is regarded by the participants as an interactional movement.

Kendon (2005) also found that a number of movements are generally not to be regarded as gestures. These movements include involuntary movements, such as patting hair and adjusting clothing; movements necessary to participate in an interaction, such as stepping closer to hear the speaker more clearly; or practical actions, such as eating, and

smoking. However, Kendon points out that this classification does not always hold true. Movements typically regarded as gestures might not be perceived as such, and movements typically classified as actions, which are not gestures, might turn into a performance and, therefore, be regarded as gesture by the participants. Thus, context matters (see Chapter 7).

To illustrate, Kendon provides the example of somebody pouring wine. On the one hand, pouring wine can simply be a practical action (and therefore not a gesture) to provide wine. On the other hand, pouring wine can be transformed into a performance and, therefore, be regarded as a gesture by the audience watching the performance. Kendon provides the following example: "[R]aising the bottle to display it, adjusting the angle for the pour, twisting the bottle at the end of the pour to stop a drop of wine from running down the side of the bottle, moving on to the next guest" (2005, p. 9). Thus, Kendon shows that a practical action in general is not a gesture, unless the movement is perceived by the participants as accomplishing something beyond its practical function. In other words, to regard a non-gesture as a gesture, observers have to perceive an action as a "performance" that is "recognized as having an expressive aspect" (2005, p. 9) that goes beyond the practical function of the movement.

As I show later in the discussion of my own findings, I found a large number of movements that are very similar to practical actions, yet, as I argue, are gestures. Therefore, I find it interesting that Kendon's discussion does not clarify how common or uncommon those instances are, and how to categorize and/or distinguish between the gestures as a group. Furthermore, his examples of practical action-like-gestures involve

instances where the gesturing speaker includes objects, whereas Kendon (similar to most other researchers) focuses on gestures performed in mid-air without including objects into the gesture. Sometimes, researchers even purposefully exclude objects that otherwise would be included in the gesture to study mid-air gestures. For example, Furuyama (2000) studies the use of gesture in origami instruction. In particular, he excludes the paper that would be used to fold origami in his study of mid-air gestures when he explains how a learner is instructed by an "expert"[8] to fold origami. In my study, I purposely include and even focus on gestures that incorporate objects and human beings to reach their expressive potential. In subsequent chapters of this dissertation, I include more in-depth discussions of the subject.

Based on his work with performance, and the history of Gesture Studies, Kendon (2005) defines gesture as follows:

> 'Gesture' we suggest, then, is a label for actions that have the features of manifest deliberate expressiveness. They are those actions or those aspects of another's actions that, having these features, tend to be directly perceived as being under the guidance of the observed person's voluntary control and being done for the purpose of expression rather than in the service of some practical claim. (p. 15)

To that end, Kendon identifies three key elements that constitute a gesture: movements, which are (1) under voluntary control, (2) done for the purpose of expression, (3) rather than in the service of a practical action.

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[8] The "expert" is a participant who has been instructed by the mediators of the study how to fold origami and then passes on his newly acquired knowledge to the "learner," another participant, who has not received the instruction.

One caveat is appropriate here. As Kendon (2005) points out, some movements that would usually be considered practical actions, might, under the right circumstances turn into gestures (for example, Kendon's example of the action of pouring wine turning into a performance) and vice versa. Later in this study, I argue that movements the instructor performs when demonstrating massage techniques to her students are gestures and not practical actions; I call these gestures "modeling."

However, deciding where to draw the line between a practical action and a gesture is often a subjective matter. For example, I argue that modeling gestures are indeed gestures and not practical actions because their primary purpose lies in demonstrating techniques to the students. They are therefore fulfilling an instructional purpose (the purpose of expressing) and not the practical action of providing a massage. Yet, not all situations I observed were clear-cut. For example, at times, a student experiences an actual pain that the instructor feels can be helped through massage. She massages the student to release the pain, but when another student watches, she often begins explaining what she is doing. Such a situation is neither clearly a practical action (massaging a client) nor only for the purpose of instruction. I had to make case-by-case decisions and determine whether I considered a movement to be primarily a practical action, that is, for the purpose of massage, or whether its primary purpose was that of expression, that is, instruction.

2.3.3.2 Gesture taxonomy and Kendon's Continuum.

Departing from Kendon's definition of gesture and analysis of gesture types, McNeill (2005) develops what he calls "Kendon's Continuum" to explain the relationship

between speech and gesture. The main gestures on Kendon's Continuum, range from gesticulations," "speech-linked gestures," "emblems," "pantomime," and "signs" (Figure 1.1). Following Kendon's research, McNeill (2005, p. 5) defines them as follows:

- "'Gesticulation' is motion that embodies a meaning relatable to the accompanying speech. […]" Gesticulation is the most frequently observed type of gesture in daily use. It primarily includes hand and arm movements, but also the head and other body parts.
- "'Speech-linked gestures' are parts of sentences themselves. Such gestures occupy a grammatical slot in a sentence […]" as in "Sylvester went [gesture of an object flying out laterally]." Gesture and speech together complete the sentence structure.
- "'Emblems' are conventionalized signs […]," as for example the 'OK' sign, formed by the ring through touching fingertips of thumb and index finger.
- "'Pantomime' […] a gesture or sequence of gestures conveying a narrative line, with a story to tell, produced without speech." Although Kendon does not explicitly discuss the role of facial expressions, it is to assume that he treats Pantomime not solely as a product of hand and arm gestures but also facial expressions and other corporeal movements.
- "'[S]igns' are lexical words in a sign language," as for example, American Sign Language (ASL). "Sign languages have their own linguistic structures, including grammatical patterns, stores of words, morphological patterns, etc."

McNeill (2005) has been the first to take Kendon's classification and to sort the gestures along a continuum. On the left side of the continuum, McNeill first positions gesticulations, next speech-linked gestures, emblems, and pantomime, finally reaching sign languages on the right side of the continuum; Kendon's Continuum (see Figure 2.1) then appears as follows:

Gesticulation → Speech-linked gestures → Emblems → Pantomime → Signs

Figure 2.1. Kendon's Continuum.

When moving from left to right on the continuum, the obligatory occurrence of speech declines and the frequency of gestures increase reciprocally and proportionally (see Figure 2.2); language properties in gestures increase (see Figure 2.3); and idiosyncratic gestures are replaced by socially regulated signs (see Figure 2.4; McNeill, 2005, pp. 5-10).

Gesticulation	→	Emblems	→	Pantomime	→	Sign Language
Obligatory presence of speech		Optional presence of speech		Obligatory absence of speech		Obligatory absence of speech

Figure 2.2. Types of gestures in relation to the occurrence of speech.

Gesticulation →	Pantomime →	Emblems →	Sign Language
Linguistic properties absent	Linguistic properties absent	Some linguistic properties present	Linguistic properties present

Figure 2.3. Types of gestures in relation to language properties.

Gesticulation →	Pantomime →	Emblems →	Sign Language
Not conventionalized	Not conventionalized	Partly conventionalized	Fully conventionalized

Figure 2.4. Types of gestures in relation to social regulation.

2.3.3.3 Thought-speech-gesture unit.

According to McNeill (2005), Kendon shows that the use of gestures is an integral part of a speaker's utterance for the listener as well as for the speaker. First, gestures provide information to the speaker that may emphasize and support what was said in speech while also adding information that was not provided through speech. Second, gestures play a crucial role for the speaker during the process of producing the utterance; speech and gestures are produced together. When observing speech and gesture, he finds that gesture anticipates speech. That is, the gesture is already in process before the related speech is produced. Thus, speech and gesture stroke are produced in synchrony and form a pragmatic unit. McNeill (2005) concludes that since gesture anticipates speech, both must be linked cognitively. As McNeill (2005) suggests, drawing on Vygotsky's research in the 1930s (1986),

> that meaning is a process; that language impacts thought; that thought impacts language; and, finally, that these mutual impacts are outcomes of a developmental process that occurred once in the history of homo sapiens and occurs again in the development of each child. (p. 80)

In locating language and gesture in a developmental framework, McNeill (1992, 2005) theorizes that imagery and linguistic content are formed together, not successively as Vygotsky suggests, but in terms of what McNeill calls "Growth Point" (GP); this is, the moment when one thought distinguishes itself and departs from the background of all other thinking. This newly formed thought is not yet separated into speech and gesture units but rather constituted of imagery and linguistic property. The thought moves on through a "microgenesis" of the GP that McNeill describes as "unpacking" (2005, pp. 82, 122-125) wherein the utterance takes on its final form in speech and gesture and is produced as such by the speaker.

However, not all scholars agree with Kendon and McNeill that gestures serve the speaker as well as the listeners. As Alibali and Heath (2000) point out, scholars debate whether gesture production has a solely communicative function or fulfills a cognitive function as, for example, in the production of thought or speech or both. In the same study, Alibali and Heath observe speakers' gesturing in face-to-face as well as in screened-off situations. They show that speakers produce representational gestures[9] in higher rates when in face-to-face situations compared to screened-off situations. Beat gestures (see Chapters 5 and 6) are produced with similar frequencies in both situations.

[9] McNeill and Kendon would call these representational gestures iconic and metaphoric gestures (see Chapter 3).

The authors conclude that gestures serve communicative as well as speaker-internal functions. In other words, gestures are beneficial for listeners and speakers; listeners are able to gain information from watching a speaker gesturing and gesturing helps a speaker think.

In an experimental study, Alibali, Kita, and Young (2000) ask "[a]t what point in the process of speech production is gesture involved?" (p. 593). They test two hypotheses, namely the Lexical Retrieval Hypothesis and the Information Packaging Hypothesis. The Lexical Retrieval Hypothesis (Alibali, Kita, and Young, 2000; Butterworth and Hadar, 1989; Krauss, 1998; Rauscher, Krauss, & Chen, 1996) holds that gesture supports the retrieval of lexical items, specifically here words with spatial content. In other words, "gesture plays a role in generating the surface forms of utterances," and thereby "a direct role in the process of speaking" (Alibali, Kita, and Young, 2000, p. 594). In contrast, the Information Packaging Hypothesis, extends two ideas of McNeill's (1992): first, "'[g]estures, together with language, *help constitute thought*' (p. 245; emphasis in original), and second, […] gestures reflect the imagistic mental representation that is activated at the moment of speaking" (Alibali, Kita, and Young, 2000, p. 594). Accordingly, gesture is involved in the conceptual planning of an utterance, and, therefore, in speech production. Alibali, Kita, and Young's results show that gesture production helps speakers organize spatial information cognitively for verbalization. They conclude that gesture use goes beyond lexical retrieval involves conceptualizing and verbalizing information. Accordingly, the findings are consistent

with the Information Packaging Hypothesis, and support McNeill's ideas of the relationship between gesture, speech, and thought.

As a result, recent research argues that gesture and speech must be regarded as two aspects of one final product; gesture is not a separate language but forms a unit with speech. In fact, they are so closely linked that they should be regarded as two different sides of one single underlying process, as one system, as McNeill (1992) argues. Furthermore, according to McNeill, gestures and speech present equally and simultaneously mental thought processes; in evolutionary terms, our brain would not have developed its language capacity without the close connection of gesture and speech. In this regard, McNeill (2005) develops a hypothesis that holds that

> the evolution of language crucially depended at one point on gestures and imagery. Without gestures, according to the hypothesis, some of the brain circuits required for language (Broca's area, including mirror neurons, and possibly others) could not have evolved in the way they have in the human brain, whereby thought and language orchestrates them directly via a thought-language-hand (and vocal) link. This hypothesis entails that the integration of gesture with language is an essential part of the machinery that was selected in evolution. (p. 233)

McNeill argues that for humans to communicate effectively through language, gesture plays an integral part in the way thought and speech develop.

McNeill's GP theory assumes that gesture and speech are produced in a synchronized fashion, however, that may not always be the case. As Goldin-Meadow's (2005) experiments show, humans sometimes produce gesture-speech mismatches, that

is, instances where gesture and speech are not synchronized, events that McNeill's framework cannot contain. According to Goldin-Meadow (2005), gesture-speech mismatches signify that a learner considers, often unconsciously, a number of different theories in his/her mind when attempting to solve a specific problem. As such, gestures display parallel solutions to verbally communicated ones. Her experiments demonstrated that learners who manifested gesture-speech mismatches responded to instruction by acquiring new knowledge whereas learners who did not do so did not gain knowledge. Therefore, Goldin-Meadow proposes that gesture-speech mismatches signify a learner's readiness to learn new information.

Building on McNeill's (1992) research in GP, Beverly Sauer (1999) proposes that inexperienced learners often gesture from an Observer View Point (O-VPT), whereas experts use Character View Point (C-VPT) and O-VPT when they gesture. As such, Sauer proposes that learners will gain critical knowledge by observing experts gesture from a C-VPT. The O-VPT indicates that the speaker looks at the story from the outside in an analytical manner; Sauer (1999) also calls this viewpoint Analytic viewpoint. In other words, when using the O-VPT, the speaker shows less personal engagement with the story narrated. In contrast, a narration through the C-VPT entails the speaker relating a story from the inside, as the character. Here, the speaker either narrates from his/her own point of view, or takes on the role (=mimics) of another character. Sauer then refers to the C-VPT as the mimic viewpoint. In her study of coal miners, Sauer shows that inexperienced miners rely heavily on O-VPT gestures, whereas experienced miners are able to draw on their embodied experience and lived practices from their work in the

mines, using C-VPT gestures to relate their experiences to others. Consequently, Sauer demonstrated that embodied experiences, such as mining, can be related to others through the use of gestures. Later in this chapter, I provide a more in depth discussion of embodied knowledge and the way gesture study can contribute to the study and understanding thereof.

As is evident, current research in the field of Gesture Studies is not concerned with delivery and rhetoric. Instead, it focuses on the relationship between gesture, speech and thought in spontaneous human communication. In addition, Gesture Studies research is often limited to experimental settings or interview situations that do not allow for observing communication as it occurs in everyday life. In this study, I argue that insights gained by researchers in the field of Gesture Studies should be of interest to rhetoricians. As gesture research shows, gesture is intrinsically tied to speech and thought; therefore, gesture is associated with argument and not ornament. Because gesture is part of delivery, it is necessary to rethink the role delivery plays in human communication.

2.4 Delivery: Gender and Technology

In contrast to Gesture Studies, current studies of delivery from a rhetorical perspective focus not on gesture but on issues such as gender, technology, or medium. In other words, the focus has now shifted way from practical instruction in oratory and the movement of the actual physical body to a more theoretical view of the body (or technology) as the medium of delivering content rhetorically.

Lindal Buchanan (2002, 2005), for example, studies eighteenth century women orators, specifically examining how they were educated to deliver speeches and general

conversations differently than the male norm. From her perspective, delivery standards are always embedded in socio-cultural environments. Because delivery has always been treated from a masculine point of view, scholars have been neglecting the role gender plays in the canon. Thus, Buchanan identifies differences in delivery between the genders based in social and biological constraints that affect how men and women are viewed in public and throughout their careers. Similarly, Carol Mattingly (2002) examines nineteenth century women's clothing and appearance as material constitutes of their socio-economic standing, and thereby as a function of delivery in the public sphere.

In her discussion of coal miners and mine safety, Sauer (1993) explores how women's voices are often silenced although they could contribute to mine safety. Sauer demonstrates how women who are not working in the mines but are married to miners, gain knowledge of mine safety through domestic work, such as doing laundry. The amount of dirt trapped in the clothes informs women about air quality and therefore about mine safety. However, because of who they are and how they communicate, the women are not heard; for the men who work in mines, the women's experiences are not readily translatable into the language of the mines. Thus understood, delivery is about delivering content with little attention to gesture. Instead, Sauer's focus is on the female body and how femininity affects delivery, a predominantly masculine defined canon.

Studies discussing technology as a means of delivering information have become increasingly important in rhetorical scholarship on delivery. However, these studies discuss technology without further analyzing how visual aspects and elements of

movement contribute to the formation of an argument, and thereby change how the human body is understood and discussed. As Newman (2009) argues,

> […] medical representations develop particular vocabularies with which to represent movement, allowing movements to contribute formally to arguments by means of what I call gestural enthymemes. Operating enthymematically, these arguments about and using movement attempt to capture or express the moments within which life, through the embodied gesture, resides. (p. 275)

In other words, movement as observed and portrayed through evolving technologies, changes how the human body is perceived and talked about. As such, movements actually form implicit arguments. Current studies on delivery and technology marginalize the body and focus instead on the technology, that is, the medium. In so doing, they still treat delivery as ornamental rather than as part of the argument.

For example, H. Hughes Evans (1993), Lisa Cartwright (1995) and José van Dijck (2005) study the changing role of technology in the medical field. Specifically, they are interested in how technology delivers information about a patient's body to the attending doctor. Evans (1993) discusses the earliest technologies in the medical field, namely the stethoscope, thermometer, and devices that measure the pulse. As he points out, the stethoscope was praised because it opened a window into the patient's body. Interestingly, the window metaphor suggests that doctors were able to see into, and not hear, the patient's chest. The thermometer allowed the patient to be evaluated qualitatively, supported by the introduction of apparatuses to measure the pulse. The instruments' use made the doctors' highly developed sense of touch almost redundant. As

a result, doctors moved away from treating each patient as an individual case and instead focused on treating symptoms as indicators of particular illnesses. In other words, the doctors' use of simple technologies changed the way s/he received and perceived information and ultimately, how s/he communicated the information to the patient.

Through the introduction of more advanced technologies such as X-ray, ultrasound, and endoscope, aspects of delivery changed even more drastically. As discussed by Cartwright (1995) and van Dijck (2005), doctors could literally see, not only metaphorically as with the stethoscope, into a patient's body. As a result, they relied less on a patient's narrative recount of his/her ailment, and more on measurements and images associated instruments, which could provide more visual evidence and often were deemed more accurate. Discussion of the human body became increasingly more disembodied. That is, physicians did not touch patients as much as before but relied on increasingly complex machines to reach a diagnosis. Inquiry shifted from the physical human body and its bodily movements to its portrayal in images assisted by technological development. From this perspective, delivery is about the medium rather than how the movement communicates. In a sense, then, delivery is still ornamental and certainly not about argument.

Bolter (1993), Porter (2009), and Welch (1993, 1999) focus on electronic forms of communication. As they discuss, the use of machines changes how information is delivered to the reader. As such, they argue that the canon of delivery needs to be extended beyond the body to include new multimodal technologies and their products. While Welch, Porter, and Bolter move beyond understanding delivery as ornamental and

treat it as part of argument, their studies focus on written products and ignore the role of the body, and with it, gesture, in the transmission of knowledge in complex multimodal environments.

At present, while Gesture Studies ignores delivery, studies of delivery do not always take a rhetorical stance and focus on issues such as technology and gender but ignore gesture. To benefit from what both areas have to offer, Gesture Studies and rhetorical delivery should be studied one in light of the other. Moreover, as the work in gender, technology and delivery shows, our environments become increasingly complex. We must better understand how humans represent and acquire knowledge most effectively, employing all the different modes and modalities to our disposal (see Chapter 8). As it is widely acknowledged, different modes of communication inherit different strengths, weaknesses, and constraints. I am interested in a specific type of knowledge, namely embodied knowledge. Researchers generally agree that this type of knowledge is very difficult to transmit through the use of language alone because it is associated with movement. I therefore explore the possibilities and constraints that lie in studying embodied knowledge and examine its connections with gesture and delivery. In what follows, I discuss and define the terms embodied knowledge, embodied practice and embodied acts, and show how they are related to each other.

2.5 Embodied Knowledge

To conduct my study on how gesture contributes to the representation of embodied knowledge, I must first define that term. First I discuss the work of Mark Johnson (1989) and then connect it with my work on gesture and rhetorical delivery.

Johnson locates embodied knowledge within the realm of human knowledge acquisition more generally.

Johnson (1989) discusses personal practical knowledge, such as knowledge that teachers possess about a subject, and argues that it is embodied. While he is able to move definitions of (embodied) knowledge forward, he is unable to pinpoint the very specific mechanics of the different modes and modalities that humans employ as they acquire said knowledge. Johnson (1989) argues that personal practical knowledge is

> knowledge that grows out of one's personal experience and is the very means of transformation of that experience. It both emerges from and restructures our world, and it has meaning and value only within the context of that experiential process of growth and change. (p. 364)

He goes on to point out that personal practical knowledge thus understood, is similar to Martha Nussbaum's (1986) discussion of the classical Greek conception of *techné* ("translated typically as 'art' or 'craft'" (Johnson, 1989, p. 364)), rather than *tuché* ("'chance,' or 'that which merely happens'" (Johnson, 1989, p. 364)).

According to Nussbaum,

> *Techné*, then, is a deliberate application of human intelligence to some part of the world, yielding some control over *tuché*: it is concerned with the management of need and with prediction and control of concerning future contingencies. The person who lives by *techné* does not come to each new experience without foresight or resource. He possesses some sort of systematic grasp, some way of

> ordering the subject matter, that will take him to the new situation well prepared, removed from dependence on what happens. (Nussbaum, 1986, p. 95)

Johnson argues that this view of *techné*, as understood by Nussbaum (1986) and MacIntyre (1988) allows humans to move beyond a mechanical "know-how" understanding of *techné*. Thereby he follows Dewey (1908/1981), rejecting "the whole dichotomy between 'knowing that' (e.g., knowing that whales are mammals) and 'knowing how' (e.g., knowing how to build a tree house)" (Johnson, 1989, p. 365). Johnson (1989) concludes,

> As far as I can see, no good has come from this alleged crucial epistemological distinction, which has served only to give us a picture of ourselves as cognitively fragmented, and which has reinforced the ill-conceived "theory/practice" dichotomy. Instead, we ought rather to conceive of knowledge as the means by which an organism (here, a human being) adapts itself to its ever-changing environment and effects changes in that environment as the organism clarifies and pursues its ends. (p. 365)

Johnson hereby rejects first, the notion of a knowledge dichotomy between "knowing how" and "knowing that", and second, the mind-body separation. He argues that personal practical knowledge is embodied, a notion that is later further developed by him (1990, 2008) and Lakoff and Johnson (1999, 2003). Lakoff and Johnson (1999, 2003) study abstract concepts and find those to be metaphorical in nature, and based in human cultural and physical, bodily experiences. In other words, human thought and communication depend on the experiences that humans can make through their bodies

and senses, and on the environments in which they live, thereby also changing these environments.

> This fact of embodied mind has several profound consequences for who you are and how you should live your life: it denies a radical mind/body separation, sees meaning, imagination, and reason as embodied, denies radical freedom, ties reason to emotion, and requires and embodied spirituality. (Johnson, 2008, p. 11)

Clearly, according to Johnson, and Lakoff and Johnson, the human mind is embodied, that is, everything humans know, is experienced through the body; humans cannot know things they have not experienced through the body. Following this line of argument, all knowledge humans possess is embodied knowledge.

While I follow Johnson's perspective on the centrality of embodied knowledge to human thought and communication, I turn to Sauer (1998) and study gesture to calibrate its operation in more practical terms. I believe that the embodiment of knowledge happens on a continuum. I hereby orient my understanding towards Sauer's (1998) framework of pit sense, engineering experience, and scientific knowledge. Sauer studied coal miners and how embodied sensory information about mining is represented in writing. She hereby identifies three categories of sensory information, namely pit sense, engineering experience, and scientific knowledge. Sauer defines pit sense as "direct physical sensations felt or perceived […] as physical signs or sensations (p. 134)[10]. Engineering experience then is the embodiment of "physical signs or indexes [that

[10] For example, in my study, students and instructors experience pit sense when giving a massage. They receive information about the body (a specific physical site) they massage on, directly through engaging their senses. They have to be physically present and engaged for the experience. Each body is different from the next.

engineers] observe and record […] as the material history of particular sites" (p. 134)[11]. Scientific knowledge is "literally invisible to the physical senses" (p. 134) and primarily represented through language[12].

As I interpret Sauer's framework, all three categories, pit sense, engineering experience, and scientific knowledge, can only be experienced and explored through the human senses. However, this experience occurs on a continuum. Pit sense requires the human body to be present in a specific situation to experience that particular situation directly. On the other end of the continuum, scientific knowledge engages the human senses necessary to perceive language, yet language is used to represent a more abstract and generalized notion of situations and sites. The human body is not physically present in those situations and at those sites; language represents a generalized version of the experience.

For lack of a better terminology, one might describe pit sense as the "knowing how" and scientific knowledge similar to "knowing that" (for example, in my study, knowledge about the human anatomy). However, keeping in mind Johnson's (1989) argument, the dichotomy of "knowing how" and "knowing that" is an artificial one. Therefore, pit sense, engineering experience, and scientific knowledge, as well as "knowing how" and "knowing that" need to be considered on a continuum. Knowledge gained through pit sense informs engineering experience, which in turn informs scientific

[11] In my study, students and instructors experience engineering experience, for example, when writing and reading client charts. These charts chronicle the history of a specific site, a specific body (here, a specific client) by, for example, maintaining information on a client's health history, such as past surgeries, and issues (such as pains) s/he reported with in the past, as well as performed treatment.

[12] Massage therapists need to have an understanding of, for example, human anatomy. This knowledge is taught primarily through textbook in a schematic and generalized way and applicable to most human beings massage therapists will encounter.

knowledge. At the same time, engineering experience and scientific knowledge are necessary to fully understand embodied sensory information received through pit sense. When using the term "embodied knowledge" in this study, I refer to what Sauer describes as pit sense, that is information sensed through the body's direct, physical involvement in a specific situation. However, I do acknowledge that pit sense, engineering experience and scientific knowledge inform each other, and, to that extend, to become an expert, a massage therapist needs to possess an understanding of all three.

While all humans possess embodied knowledge, it is not directly accessible to the outside observer or even explicitly to the associated individual. Embodied knowledge can only be studied through its external manifestation in embodied acts and embodied practices. These are the acts that represent the embodied knowledge from one person to another. Scholars agree that spoken and written language alone cannot explain how people communicate in complex situations. Despite acknowledging that human communication takes place in increasingly complex multimodal environments, researchers have yet to understand how humans represent embodied knowledge in such environments. I believe that the field of rhetoric and, more specifically, the study of delivery and gesture together, can extend our understanding of the ways in which embodied knowledge is passed from experts to learners. As I discuss below, scholarship has focused on embodied acts (Haas, 1996; Haas, & Witte, 2001; Sauer, 1998; Wolfe, 2005) in the practice of literacy, without a specific focus on gesture and rhetoric. As indicated above, scholars agree that written and spoken language alone cannot explain the representation of embodied knowledge between experts and learners. I add to that

understanding by linking rhetorical delivery and Gesture Studies with embodied knowledge to further our understanding of the representation of knowledge in complex situations.

Although interest in and understanding of embodied knowledge has increased, scholars struggle to formulate an all-encompassing discussion how embodied knowledge is represented to others. Haas and Witte (2001) take on the daunting task by focusing on embodied acts. They define an act as embodied when it is "accomplished by means of the human body." They continue,

> [e]mbodied acts always take place in real time and in specific physical spaces, and they entail the usually skillful and often internalized manipulation of an individual's body and of tools that have become second nature, virtual extensions of the human body. In many ways, embodied acts are lived experiences and, as such, are intrinsic to a human life world—the world of the senses, the world of affect, and the world beneath words. (p. 416)

Following Scribner and Cole (1981, p. 236), Haas and Witte (2001), develop the idea of embodiment by introducing the concept of "practice," which they define as "a recurrent, goal-directed sequence of activities using a particular technology and a particular system of knowledge" (p. 416). In other words, embodied knowledge becomes visible through embodied acts that combined constitute the act of embodied practice; embodied practice then is the actualization of the potential contained in embodied knowledge. We are unable to observe embodied knowledge directly. However, we can gain insight into embodied knowledge by studying embodied practices. Embodied practices are actions

that respond to highly specific situations and rely on highly specific sets of knowledge, particular to the situation. For example, in my study, participants rely on a system of knowledge specific to massage therapy and employ it to achieve specific goals, such as relieving a client's muscular pain.

Good and DelVecchio Good (1993), and Prentice (2007) explore how medical students develop into expert physicians and surgeons. To gain insight into how medical knowledge and the "world" of medicine itself are constructed from the students' points of view, they focus on the forms of reasoning students learn as they are undergoing the process of becoming physicians; in particular, they examine those processes that change their conception of the field of medicine. While Good and DelVecchio Good consider how students learn to conceptualize the field of medicine as insiders, Prentice struggles with understanding how surgeon's apprentice embody skills and knowledge of expert surgeons. She argues that to become an expert surgeon, students are required to master technical as well as social skills. Accordingly, Prentice shows how students in the operating theatre are part of a hierarchy that not only determines their place in the team but also the type of procedures they are encouraged to complete. Thus, the students' upward movement in the hierarchy depends on them developing technical skills and their social judgment. Although Good and DelVecchio Good as well as Prentice explore aspects of gesture in the students' acquisition of embodied professional knowledge, they do not connect gesture to aspects of rhetoric.

Cheville (2001) also studies students in an educational environment, focusing on the role of the body in the process of knowledge acquisition. She compares learning in

the academic classroom with learning through sports activity including the body. Her research is grounded in a substantial ethnographic study of female basketball college athletes who the author observed through her experience as college instructor, writing instructor, and basketball coach. Through such efforts, Cheville points out how athletes struggle in two conflicting worlds. First, they are athletes who are learning and experiencing their environment through their own body, engaged in activity on the court as athlete. Within this, their bodies also signify a certain race and gender within a particular history of the sport within a specific society. Second, the student athletes also belong to an academic learning environment, the classroom that emphasizes the mind over the body. Here they are often discouraged from drawing on their bodily experiences from the basketball court. Accordingly, Cheville demonstrates that thought is not primarily determined through language but equally depends on physical (corporeal) experiences, intertwined with a social and historical context.

Although these studies contribute to our understanding of how individuals learn embodied practices, none addresses the particular process through which embodied knowledge is transmitted. Researchers agree that language alone cannot do the job, and thus the body is involved.

In addition to her work on miners and the representation of embodied sensory information in writing, Sauer (1999) follows up on her own call for future research by exploring the use of gesture in the representation of risk in coal miners' education and experience. As discussed earlier, Sauer investigates the differences between lay and expert miners and shows that lay miners mainly employ O-VPT gestures, whereas expert

miners often use C-VPT. Yet, this focus on embodied knowledge leaves out the rhetorical element. What Haas and Witte call "the world beneath words," in discussing embodied practices, is addressed more explicitly by Sauer (1998) who states "embodied information is not present in written communication" (p. 161), and consequentially poses the question, if not in written communication, "where is it located" (p. 161). She concludes that future research needs to focus on modes and modalities other than written texts, such as gesture.

To that end, Haas and Witte (2001) explored embodied acts and embodied representation in association with the revision process of a technical document involving employees of a city government and a consulting engineering firm. Haas and Witte move beyond Sauer's scope on written communication and take into account the complexities of the situation through an analysis of verbal (written and spoken text), visual (graphs, images, gestures), and spatial (organization of the meeting room, positioning of participants) data.

In their discussion of gesture, Haas and Witte focus exclusively on deictic gestures in meaning-making within the context of composing a written document. They conclude that gestures "function as representational tools" and "may be 'trial locutions' or 'pre-texts.'" (p. 444). In other words, gestures encode information and knowledge not yet translated into language. Because gestures play an important role in facilitating embodied knowledge representation, it follows that the study of gestures supports the study of embodied knowledge. Thus, Haas and Witte demonstrate that making gestures is

similar to the act of writing because both involve hands, arms, and the whole body. But again, their work is not explicitly rhetorical.

Wolfe (2005) studies a group of writers who collaborate on a writing project. She observes the gestures made by the writers to communicate ideas to the others. Thereby Wolfe develops Haas and Witte's understanding of gestures' function as pre-text within the context of knowledge representation and writing among participants in a group exercise. In other words, she demonstrates that gestures play a crucial role in writers' attempts to "translate emerging, abstract ideas into an embodied representation" (p. 325). However, she also shows that gestures can lead to misinterpreting the actual amount of work an individual contributes to a writing project. Specifically, Wolfe's data show that men who gesture more but discuss less than the women in a project are nonetheless considered main contributors. Furthermore, the group in her study felt as if it had already written the piece under consideration, while they had "only" discussed content and organizational aspects.

Both Haas and Witte's, and Wolfe's studies make strong cases that gesture contributes to the representation of embodied knowledge. To that end, the authors employ Kendon's and McNeill's gesture taxonomies. Although both studies recognize that objects are part of a speaker's immediate environment, none discusses if touch contributes to the gesture performed and therefore to the information represented. And again, none of these studies is explicitly concerned with rhetoric and delivery.

Although these studies contribute to our understanding of how individuals learn embodied practices, none can conclusively answer questions about the particular process

through which embodied knowledge is represented. Researchers agree that language alone cannot do the job and thus the body is involved. However, no one has yet determined how bodily actions contribute to the knowledge transfer. Although I do not claim that my study answers these questions conclusively, I believe that my findings contribute to our understanding of the processes involved in the representation of embodied knowledge.

2.6 Linking Gesture, Delivery and Embodied Knowledge

Because my goals involve integrating gesture, rhetorical delivery and embodied knowledge, my final step in this chapter is to explore scholarship examining the three areas.

As Hawhee (2004) argues, the body played a central role in the education and practice of ancient Greek rhetoricians and orators, who looked at athletic training and performance for guidance in becoming rhetors. However, Hawhee, referring to Isocrate's treatise, makes a strong case that

> the connection between rhetoric and athletics neither began nor ended with training, but rather emerged from long-time cultural association through agonistic performances in festival and funerary celebrations, associations that carried forward into training practices as rhetoric developed as an art, a *techne*. At the heart of the connection between athletics and rhetoric, then, is an appreciation for the immediate relation between training pradtices [*sic*] and performance. Because of this shared recognition, these joint arts privilege situated learning and

> cumulative practice in a chiasmatic way that incorporates performance into learning, learning into performance. (p. 7)

While athletic and rhetorical training practices and performances focused on the body, the ancients acquired situational bodily corporeal conduct for both based on the three Rs—rhythm, repetition, and response. In other words, every learner had to first understand ("getting a feel" (p.160)) the rhythm of the activity at hand. No matter if the activity in question was a rhetorical, athletic or other kind of movement (e.g. learning music or dance), it had to be experienced through every fiber of the body, "trafficked through and by neurons, muscles, and organs" (p. 160). Repetition then served to strengthen the newly learned bodily knowledge until that body could respond intuitively to the situation at hand (p. 160, 190, 193). Thus, Hawhee makes a convincing case that historically, rhetoric was more than an exercise of the mind but rather "full-on, whole body encounter between rhetor and rhetor or teacher and student, an art concerned with a deeply habituated, embodied, situated intelligence and sense of timing" (p. 190).

Now more than ever before, we possess mounting evidence that our bodies are deeply intertwined with the ways in which we perceive, define, and construct the world in which we live. Yet, we live in a world in which learning often separates physical experiences and thinking, or in other words, the mind and the body.

Lakoff and Johnson (1999, 2003) have presented a convincing argument against the dualistic notion that splits mind from body. Instead, they argue that mind and reason are embodied; this means that abstract concepts are metaphorical in nature and are based in human cultural and physical embodied experiences. In other words, the ways in which

humans think and communicate about the world depends on the experiences they are able to make through their bodies and with their senses, within the environments in which they live and interact with others. These experiences are then mirrored in the metaphors humans use to communicate about abstract concepts such as time, argument, and self. For example, Lakoff and Johnson (2003) provide examples of "metaphorical expressions in everyday language [that] can give us insight into the metaphorical nature of the concepts that structure our everyday activities" (p. 7). For example, the metaphorical concept of TIME IS MONEY is visible in expressions such as "You're *wasting* my time. This gadget will *save* us hours. I don't *have* the time to *give* you." (pp. 6-7; emphasis in original), and so forth. Consequently, rhetorical scholars cannot neglect but rather need to pay attention to the role of the body in human communication.

As Cheville (2001) argues in her study of student basketball athletes, "the separate function of athletic and academic domains reinforces a longstanding philosophical distinction between thought and action" (p. 3). As her study shows, student athletes struggle with artificial separation of the physical, athletic environment, which emphasizes learning through and with the body, from the academic environment where learning through the mind is foregrounded. Thus, Cheville argues that the athletes she observed, as well as students and other learners, would generally benefit from rethinking frameworks that artificially separate body, mind, and activity and by acknowledging their partnership and combined potential in learning (p. 110).

While a study that collects its data in a massage instruction environment might be quite different from a study that focuses on Greek athletics, the environment towards

which ancient Greek rhetoricians and orators oriented their art, have certain commonalities. Both environments rely deeply on the involvement of the body in human learning and performance. Following this work, my study contributes to integrating rhetoric, Gesture Studies and embodied knowledge as represented in complex situations.

2.7 Conclusion

From Classical Antiquity through the Elocutionary Movement, gesture has been a component of rhetorical delivery, but gesture has typically been considered ornamental rather than argumentative vis-à-vis speech. When Gesture Studies separated from rhetoric in the mid to late twentieth century, its scholarship proposed that gesture was more than ornament. In fact, it demonstrated that gesture is connected to human thought; gesture is part of how humans argue and reason. As Kendon (2005) puts it: "there is a wide range of ways in which visible bodily actions are employed in the accomplishment of expressions that, from a functional point of view, are similar to, or even the same as expressions in spoken language." He continues, "At times they are used in conjunction with spoken expressions, at other times as complements, supplements, substitutes or as alternatives to them" (p.1). In other words, gestures are not merely ornamental, as argued from Classical Antiquity through the Elocutionary movement. Gestures are, as McNeill (1992, 2005) argues, an intrinsic part of thought and speech. Because gesture is part of delivery, and without gesture, human communication would be different, rhetorical scholars should pursue rethinking the role delivery plays in human communication. Following Gesture Studies, rhetorical scholarship should examine how delivery not only affects an audience's emotion but is also intertwined with human cognition and argument.

My study, as many others before, shows that gestures are an intricate part of human communication in general and knowledge representation more specifically. In addition to better understanding the relationship between gesture and rhetorical delivery, my work expands efforts to understand embodied human (inter)action in complex multimodal environments. Recent research in multimodality has acknowledged that human communication includes multiple semiotic systems, such as alphabetical language, visual imagery, gesture, and sounds. However, researchers have focused on visual imagery and print language (Kress, 2003; Kress, Jewitt, Ogborn, & Tsatsarelis, 2001; Kress, & van Leeuwen, 1990, 1996, 2001), or multimodal situations, as, for example, proposed through Mediated Discourse Analysis (MDA) (Norris, 2004a, 2004b; Norris, & Jones, 2005; Scollon, 2001). Accordingly, research has neglected the role of gesture in complex environments.

When humans (inter)act in multimodal environments, information and knowledge are represented through different modes. Vast amounts of knowledge arise out of sensory experiences and embodied practices. As Sauer (1999) points out, such knowledge is not easily relayed through spoken or written language but rather has to be experienced in the environment and situation in question. While the main focus of my study involves gesture and rhetorical delivery, my results also contribute to scholarship on multimodality and embodied knowledge.

Throughout the instructional situations I have observed, I have found various types of gestures, including some that have not yet been identified and included in existing taxonomies. My findings mirror Kendon's (2005) observation of the relationship

between gesture and speech; the gestures I observed occurred in "conjunction with spoken expressions, at other times as complements, supplements, substitutes or as alternatives to them" (p.1). In other words, depending on each individual situation, speech, gesture, or some other mode, will play the major role in the representation of information.

I argue that gesture takes on a major role in the knowledge representation process involving embodied knowledge. However, I do not believe that gesture alone is responsible for the knowledge representation. I believe that is it crucial to acknowledge the role of all modes involved in one communicative act and that none of them should be ignored within each act. Each mode offers its own contribution to the knowledge representation. As stated earlier, depending on the specific situation, one or the other mode will play a leading role; yet the other modes are just as crucial for the successful completion of the interaction. To demonstrate my argument further, the next chapter discusses theoretical frameworks and the methodology I employ to study gesture and delivery in complex situations.

CHAPTER 3

Methodology

Before this chapter addresses how I carry out the study, I first provide a historical overview of the different theoretical frameworks that allow my methodology to emerge as I employ it. To begin, I discuss Halliday's theory of systemic functional linguistics (SFL), which focuses primarily on language, then connect it with other scholars' insights into multimodality, extending SFL to accommodate modes other than language. Next, I explain how mediated discourse analysis provided me with a heuristic tool with which to connect the aforementioned theories with the gesture taxonomies out of which my methodology arises. The chapter closes with an illustration of my methods for collecting and analyzing the data for this study.

3.1 A Historical Overview of Theoretical Frameworks

As introduction to a historical overview of the theoretical frameworks, first let me offer a word on my understanding of gesture. My goal is to advance current understanding of the roles gesture plays in human communication and, more specifically, understanding of how humans represent and exchange knowledge in instructional situations. To those ends, I understand and treat gesture as one social semiotic employed among a multitude of other semiotics. Through the following discussion, I hope to

illuminate two issues: (1) I hope to make the argument that gesture is indeed a social semiotic, and (2) I illustrate how our understanding of semiotics as social evolved from a primarily language (speech, writing) centered view (Halliday, 1977, 1978) to one more inclusive of many modes (Cope, & Kalantzis, 2000; Iedema, 2003; Kress, 2003; Kress, Jewitt, Ogborn, & Tsatsarelis, 2001; Kress, & van Leeuwen, 1990, 1996, 2001; Witte, 1992).

3.1.1 Halliday's theory of Systemic Functional Linguistics.

M. A. K. Halliday's (1977, 1978) theory of systemic functional linguistics (SFL) proposes that language developed and functions the way it does because it is used by humans to communicate with each other. He states,

> Language arises in the life of the individual through an ongoing exchange of meanings with significant others. A child creates, first his child tongue, then his mother tongue, in interaction with that little coterie of people who constitute his meaning group. In this sense, language is a product of the social process. (Halliday, 1978, p. 1)

As such, language is learned and produced by individuals within a social context. He continues,

> A child learning language is at the same time learning other things through language—building up a picture of the reality that is around him and inside him. In this process, which is also a social process, the construal of reality is inseparable from the construal of the semantic system in which the reality is encoded. In this sense, language is a shared meaning potential, at once both a part

> of experience and an intersubjective interpretation of experience. (Halliday, 1978, pp. 1-2)

For Halliday, language is a unit which combines the processes of learning a language and of learning about the realities of the world that are encoded through the language. As such, the learning of a language, as well as its usage, are social processes. Language itself, then, possesses "a shared meaning potential" (p. 1) that not only allows users of that language to communicate about the world they experience but also to shape the parts of the world to which they belong. In that sense, language is a social semiotic.

According to Halliday (1977), language fulfills a number of functions that become most clear when observing a child who is learning his/her mother tongue. The child discovers first that language is instrumental, that is, "language is used as a means of getting things done" (p. 3). In addition, the child finds out that language is regulatory because it is used to "regulate the behavior of others" (p. 4). Furthermore, s/he acquires and understanding of language as interactional; that is, it is used "in the interaction between self and others" (p. 5). The child also comes to understand that language is heuristic (p. 6); it enables humans to explore the environment in which they live and interact. It is imaginative; it "provides […] elements of the metalanguage, with words like *story, make up* and *pretend* (p. 7; emphasis in original). Finally, the child discovers that language is representational, "a means of communicating about something, of expressing propositions" (p. 8). While discovering these functions, the child learns to master the language, slowly developing his/her ability to use the different functions of the

language, a process that Halliday describes as "adopting a sociolinguistic perspective on language" (Halliday, 1978, p. 21).

> As such, language, according to Halliday (1978) is
>
> regarded as the encoding of 'behaviour potential' into a 'meaning potential'; that is, as a means of expressing what the human organism 'can do', in interaction with other human organisms, by turning it into what he 'can mean'. What he 'can mean' (the semantic system) is, in turn, encoded into what he 'can say' (the lexicogrammatical system, or grammar and vocabulary) […]. (p. 21)

Language, for Halliday is a potential; what a person 'can do' linguistically, is what s/he 'can mean'. Therefore, Halliday describes language as a "meaning potential" (p. 28) which humans can realize by using words according to appropriate systems of grammar, semantics, phonology, and the like.

According to Halliday (1978), for the adult speaker (and hearer), this "meaning potential" is realized through metafunctions, more specifically, four "functional components" (p. 128), namely "experiential, logical, interpersonal and textual" (p. 128). Halliday further argues that the experiential and logical function are closely related and therefore can be treated as "ideational" function (p. 128). To be realized properly as print linguistic text, any (adult) linguistic construct needs all four functions operational at once, because "any instance of language in use 'means' in these various ways […]" (p. 129). As such, Halliday recognizes the significant dimensions of language use in context, focusing to that end on print linguistic uses.

3.1.2 Study of multimodality.

Although Halliday acknowledged that humans rely on semiotic systems other than (spoken and written) language for meaning-making (e.g. gesture (1978, p. 37)), his theory was focused on language. Only in the mid to late 1980s did the analytical focus shift to include other non-linguistic dimensions in the analysis of communicative events (Iedema, 2003). First examples can be found in Theo van Leeuwen's (1984) work on intonational aspects of linguistic speech. Later research extended and appropriated Halliday's systemic-functional framework to study sound and music (van Leeuwen, 1999) and visual representation (Hodge, & Kress, 1988; Kress, & van Leeuwen, 1990). Gunther Kress, Carey Jewitt, Jon Ogborn and Charalampos Tsatsarelis (2001) extended Halliday's theory to analyze multimodal teaching and learning. That is, they not only focused on print language alone, as Halliday did, but came to understand language as comprised of many different modes, such as visual images, and gesture.

> However, the problem that arises, and that Witte (1992) points out, is Halliday's approach—although certainly broad in terms of its dealing with the social and functional dimensions of language (including writing)—does not provide a way to account for the production or use of a large variety of texts that appear in contemporary culture, particularly those that embed nonlinguistic symbol systems. (p. 241)

In contrast to Witte's suggestion that Halliday's language-based theory cannot treat recently developed non-word based communication, O'Halloran (2008) argues that SFL's theoretical apparatus is well-suited for multimodal discourse analyses because "it is a

social semiotic theory where the meaning is seen to be context-dependent" (p. 444). Halliday's metafunctional principle of language provides the tools for "theorizing how semiotic resources interact to create meaning" (O'Halloran, 2008, p. 444).

> The metafunctional principle is the principle that semiotic resources simultaneously provide the tools for constructing ideational meaning (i.e. experiential meaning and logical relations) and for enacting social relations (i.e. interpersonal meaning). The metafunctions are enabled through the organization of the discourse, which is the textual metafunction of semiosis. The metafunctional principle provides a basis for examining the functionalities of semiotic resources and for analyzing the ways in which semiotic choices interact in multimodal discourses to fulfill particular objectives. (O'Halloran, 2008, p. 444)

In other words, O'Halloran argues that the metafunctional principle as described by Halliday not only applies to the ways language creates meaning but can be extended to analyze other semiotic, nonlinguistic choices as well. O'Halloran furthermore argues that when SFL is applied to and extended by multimodal discourse analysis, the result allows for transdisciplinary studies, such as an "approach to mathematical discourse involves mathematics, linguistics, semiotics, studies of visualization and mathematics education" (pp. 444-445).

Accordingly, authors such as Gunther Kress, Theo van Leeuwen, Carey Jewitt, Jon Ogborn, Charalampos Tsatsarelis, Anthony Baldry, Paul J. Thibault, Ron Scollon, Sigrid Norris and Rodney H. Jones extend and appropriate Halliday's (1977, 1978)

theory for their multimodal and multisemiotic textual analyses (Baldry, & Thibault, 2006; Kress, 2003; Kress, Jewitt, Ogborn, & Tsatsarelis, 2001; Kress, & van Leeuwen, 1996, 2001; Norris, 2004a, 2004b; Norris, & Jones, 2005; Scollon, 2001). As those authors propose, communication is not primarily monomodal but multimodal. In other words, humans live and interact in complex environments and communicate not only through speech and writing but also through visual images, gesture, sounds, and the like. The New London Group (Cope, & Kalantzis, 2000) characterizes semiotic systems as the bases of human communication as follows: Visual Design, Audio Design, Spatial Design, Linguistic Design, and Gesture Design as well as all of those taken together as Multimodal Design. As they note, new technologies allow us to compose text with traditional alphabetical language but also images, sounds, etc. In addition, speech and writing themselves are multimodal. A speaker relies on spoken words as well as on paralinguistic signs such as pitch and prosody. Similarly, print-text consists not only of printed words but also other design aspects such as layout, font, and size. Human communication, it seems to me, has been multimodal for as long as humans have communicated but only recent research acknowledges this circumstance and applied the term "multimodal" to it.

3.1.3 Mediated Discourse Analysis.

Out of the tradition of the multimodal and linguistic discourse analysis approaches discussed above emerged mediated discourse analysis (MDA). What connects all three approaches is the shared belief that the modes involved in discourse developed according to their use and function in human communication. Proposed by

scholars such as Scollon (2001), Norris (2004a, 2004b), and Norris and Jones (2005), MDA focuses on the action in human communication. That is, MDA moves "discourse analysis beyond the analysis of texts to consider questions about the actions people take with them, as well as with other cultural tools, and the social consequences these actions have" (Norris, & Jones, 2005, p. xi). To those ends, MDA shares many insights and analytical tools with the frameworks mentioned above. However, MDA departs from them in one significant way, namely, rather than proposing that *discourse is action*, MDA instead works on the premise of *discourse in action*. In other words, MDA proposes that discourse is only one of many different tools that humans have at their disposal to take action. Therefore, "'meaning' does not so much reside in the discourse itself, but rather resides in the actions that people take with it" (Norris, & Jones, 2005, p. 4). This shift in focus from discourse to action allows MDA to maintain the complexities of human interaction in highly specific social situations.

MDA brings together fields such as discourse analysis, linguistics, anthropology, psychology, and sociolinguistics which, in turn, allows scholars to rely on analytical tools provided by scholars in other traditions (Norris, & Jones, 2005). Following MDA's philosophy to choose methodologies as they are best suited to carry out one's research, and not, according to the field from which they are drawn, I consider it beneficial to use analytical tools developed by researchers in the field of Gesture Studies.

Although scholars widely acknowledge that human communication is multimodal, scholarship in rhetorical studies, as discussed in Chapter 2, has paid little attention to the role gesture plays in human interaction. However, in the field of Gesture

Studies, scholars such as Kendon (1997, 2000, 2005, 2007), McNeill (1992, 2000, 2005), and Goldin-Meadow (1999, 2005, 2007) have advanced understanding of the interplay of gesture, speech, and thought. In the course of their studies, they have developed a number of frameworks and taxonomies that assist the study of gesture.

Accordingly, MDA offers me as a heuristic tool with which to connect Halliday's theory and its extensions into the realm of multimodality with taxonomies developed in the field of Gesture Studies. In other words, MDA allows me to move beyond a discourse analysis based on texts and into an analysis that focuses on human action, something that Halliday's original SFL theory, as well as the extensions that came out of it, do not allow me to do. More specifically, MDA permits me to study multimodal environments through the lens of action rather than discourse and promotes the inclusion of analytical tools from other fields in which researchers study semiotic systems of interest. The analytical tools I employ in this study are taxonomies taken from the field of Gesture Studies. To that end, MDA functions as a bridge between traditional theories of language and more recent multimodal extensions thereof along with analytical tools from the field of Gesture Studies. This use of MDA as a heuristic allows me to study gesture's use and function as one of many social semiotic systems in human communication.

However, these gesture taxonomies have been developed and applied mainly in experimental settings and often observed in speech as narrative, i.e. someone narrating a (cartoon) story. Furthermore, those taxonomies are comprised mainly of gestures performed "mid-air," that is, without the speaker touching objects, him/herself or others. Speakers often include touch in their gestures. As Goodwin (2000, 2003, 2007) points

out, researchers should consider including the objects that are pointed at or that are included in the gesture. These issues not withstanding, I believe that existing gesture taxonomies are appropriate to my study because the movements I describe, classify, and analyze as gestures fulfill the same definition of a gesture as the "mid-air" gestures studied in laboratory settings.

In this, I follow Kendon's (2005) definition of gesture as actions that "tend to be directly perceived as being under the guidance of the observed person's voluntary control and being done for the purposes of expression rather than in the service of some practical claim" (p. 15). Furthermore, the gestures observed in the laboratory, similar to the ones I observe in a classroom setting, are produced spontaneously for the situation and have not been practiced beforehand. Finally, the definition does not specify that movements have to be "mid-air" to be gestures; therefore, "mid-air" and "touch" gestures are variants of gesture. As such, my study extends current gesture taxonomies by Kendon and McNeill into the realm of "touch gestures" and develops a new methodology for transcribing gestures, as I discuss later in this chapter.

3.2 From Past Theory to Present Methodology

At this point in discussing the different theories and methodologies from which I develop my methodology, it is important to illustrate more clearly what role MDA plays in this development. To reiterate, for me, MDA functions as a heuristic tool with which to connect SFL on the one hand, and multimodality with gesture taxonomies, on the other hand. As far as I know, no scholar has ever related these methodologies in this way to create a platform for studying gesture in relation to rhetoric and delivery.

As discussed earlier and following Witte (1992), while SFL successfully theorizes how language functions by taking social context into account, it falls short in its application to other semiotic systems that go beyond the printed "word," such as images, sounds, and gestures. Because SFL has been recognized as a social semiotic theory (O'Halloran, 2008), it can be extended to study social semiotics other than language. However, SFL, or any appropriation thereof, cannot alone help me study how humans use gesture and what role gestures play in the representation of knowledge. They do not provide me with the analytical tools needed to evaluate, categorize, and analyze gesture. To link SFL and multimodality with the framework and taxonomies of Gesture Studies, I use MDA. Next, I discuss how MDA makes this linkage possible.

MDA, as proposed by Scollon and Scollon (2004), and applied by Norris and Jones (2005) is also referred to as nexus analysis. The notion of "nexus" is an important one for MDA because "texts connect users to each other in a complex nexus of practice" (Norris, & Jones, 2005, pp. 3-4). The "nexus of practice" is the intersection of social actors, social practice, mediational means, and mediated practice in historical cycles. As indicated, nexus analysis is not a strict methodology but rather a heuristic tool that allows researchers to position themselves with respect to the research question asked, to the participants of the research, and to the actions and discourse that will be the focus of their research. Every nexus of practice is different, and scholars have to adjust their methodology according to the studied socio-cultural situation.

Following Scollon, Scollon, Norris, and Jones, the nexus analysis consists of three basic steps[13] described below: (1) engaging in the nexus of practice; (2) navigating the nexus of practice; and (3) changing the nexus of practice.

(1) Engaging in the nexus of practice.

MDA assumes that all scholars have a stake in what they study and, thus, that the researcher must continuously reflect on this circumstance during the study. A researcher should not be guided by his/her own bias but by the lived experiences of those s/he wishes to observe. To gain an initial understanding of the lived experiences of the participants, or, in other words, what is important to them and, therefore, to the focus of the study, a researcher should undertake a preliminary data collection. Because MDA is always participatory, participants should be actively involved in the research.

Before I could undertake my study, I conducted research at related sites. Two studies of preliminary data collection aided my understanding of what modes are important for participants of an interactive educational situation. In the two studies preceding the current one, I observed instructor and students during a massage therapy workshop; each workshop on relaxation massage lasted four hours. Those workshops were not aimed at future professionals but at people interested in learning a few very basic relaxation massage techniques; they then could practice these techniques on family and friends in their free time but not as a profession or for therapeutic reasons. At the time, my interest was not in gesture but in observing multimodality in a recreation and

[13] For a much more in-depth discussion, please see Norris, & Jones, 2005, and Scollon, & Scollon, 2004.

wellness environment. More specifically, I was interested in the interplay of images and text during instruction.

Through observing the workshops, I realized that despite the use of an instructional text and speech, bodies played a very important role in the instruction and learning processes, a circumstance of which instructor and learners were well aware. Perhaps not surprisingly, given that massaging someone is a physical and hands-on activity, bodily actions, including gesturing, took up most of the interactions in the workshops I observed, while talk overwhelmingly focused on kinesic practices. By engaging in these practices, both through observation and discussion with participants, these early studies allowed me to understand that bodily performances of various kinds were indeed crucial within an instructional environment for massage, and as such crucial for the lived experience of the participants. Hence, an environment focusing on the instruction of massage therapy would allow me to study the use and role of gesture in the transmission of knowledge.

(2) Navigating the nexus of practice.

The second step entails the researcher's engagement in data collection and analysis of the study itself. The artifacts collected must be multimodal and multiperspectival. That is, the researcher may collect audio examples, video examples, written examples, etc. Additionally, the researcher may also study the ongoing actions from multiple perspectives, for example, from the point of view of a general 'member' of a particular group, from the point of view of an individual of the group, from his own point of view. To that end, s/he compares his/her and the observed individual point of

views, for example, by discussing findings with the participants as well as by listening to participants' opinions on what they consider important in certain situations and how they interpret particular events. This interaction with the study participants allows the researcher to limit what artifacts are collected, and to determine which are the most feasible and supportive of his/her research questions.

For my main source of data collection, I decided to videotape my participants (instructor and students) because gesture is a complex, visual medium. I believe that to observe interactions without the help of recording technology while taking notes would not have allowed me to reflect the visual aspects of the situation as precisely as I needed to analyze the use and role of gesture. In addition, I took fieldnotes, spoke with the participants[14], examined the textbooks and workbooks used in class, followed the instructor's PowerPoint presentations and writings on the whiteboard as well as other modes of instruction (see Chapter 4).

Nexus analysis focuses on the changes and transformations through which human action and discourse moves, a concept further developed by Iedema (2003) under the term "resemiotization" (Iedema, 2003). While the transformation of discourse is often described as occurring in temporal cycles (e.g. calendar and academic years), resemiotization refers to the process whereby information not only passes through these cycles but also through different modes (e.g. speech, writing), and changes according to the affordances and constraints of the particular mode. For example, the observed

[14] During the preliminary study, I was able to interview the instructor formally and to conduct surveys with the learners. For this study, I interacted with students and instructor in a less scripted manner by asking them questions and talking with them about their classroom interactions and professional experiences whenever the situation allowed for such an exchange.

massage therapy students and instructors interact within the cyclic repetitions of semesters and academic years. At the same time, every student follows cyclic successions of courses and materials to successfully complete degree requirements. Instructors are former students and, therefore, have already completed the cycle of coursework to obtain their degree. As instructors, they now, often repeatedly, guide new cohorts of students through the same (or at least very similar) cycle of coursework and semesters. The information and experience exchanged in these classes undergoes yet another cyclic change, specifically the resemiotization of information, through its translation into different modes that students and instructors employ to exchange information and expertise.

While information is resemiotized into a different mode, it changes according to the constraints of a particular mode. For example, written text, at least in the Western world, is commonly read from the upper left to the lower right, with the information unfolding in a linear fashion. Images, on the other hand, have multiple entry points; their "reading" and information development does not follow a linear, pre-defined path and structure. Through their visual components, images may also supply information that text often cannot provide. In my study, textbooks contain written text and images that inform students about a particular massage technique, each providing certain data. The instructor discusses the same information with the students through the use of speech and gestures. These provide additional information and perspectives than the textbook alone. Other modes, such as PowerPoint presentations, video recordings, or plastic skeletons or mannequins may be used to support the highly speech-based part of the instruction with

yet other data. Usually as a next step, the instructor demonstrates to the students the technique s/he has just discussed before students then move on to practice them on their own; at the same time they receive feedback from other students and the instructor. To test students on their newly acquired knowledge, written (often multiple-choice) tests are conducted. In other words, the process of knowledge acquisition begins with instruction based heavily on written language and images. It then moves to instruction heavily based on spoken language and gestures. This is followed by instruction heavily based on demonstration through the use of practical actions, speech and gestures, with students practicing them. Finally, students translate the physical (bodily) experiences back into spoken and written modes in classroom and exam settings (see Chapter 8). Interestingly, although the program I observed requires students to demonstrate their knowledge of massage by demonstrating a massage and test taking, the final state and national licensing exams students are solely written multiple-choice tests.

Yet another cycle may begin when students develop an interest in further studying the subject matter of massage, the body, and health; finally they conduct their own research to produce articles and (text)books to educate a new generation of students. To that end, students and instructors of massage therapy instruction are involved in different cycles of knowledge representation, production, and transmission in different modes and modalities.

(3) Changing the nexus of practice.

MDA's goal is to produce positive social change. Therefore, changing the nexus of practice is a crucial part, not by-product, of the research. However, the changes a

researcher makes may go beyond those intentionally planned. Therefore, to fully understand the changes that take place throughout a study, the researcher must first acknowledge the changes that took place when s/he joined the discourse. Two elements are operating here. First, the change (positive or negative) occurs simply through the researcher's presence in a discourse community. Second, a (ideally) positive social change occurs in a discourse community when the researcher shares his/her research results.

As I observed in my own study, using a video camera is something that can easily disquiet study participants. Video cameras record every word and every movement a person makes. Participant reactions to "being observed" can vary widely from person to person; each person reacting must be taken into account by the researcher when interpreting his/her findings; some of the behaviors and interactions observed may differ from those that would occur if the researcher would not be present. As I will discuss more in depth in the next chapter, two out of the three instructors I videotaped provided me with feedback regarding their perceptions of being taped. One instructor, after an hour or so of the first class, walked by the video camera and me and suddenly realized that I was standing there videotaping. Being engaged in her own teaching, she already had forgotten about her role as a participant in my study. However, the second instructor mentioned repeatedly that he felt he should act and gesture elaborately because I was videotaping his instruction. With regard to the students, most seemed shy during the first day of observation but eventually enjoyed interacting with me by sharing their stories.

While the situational changes just described are commonly known phenomena researchers consider, MDA also focuses on a second type of change, which is caused by the researcher's presence. This change results from the MDA researcher's goal that always should be to invite positive change in the environment observed and studied. While I do not think that I have yet had a positive influence on the discourse community I observed, I hope to contribute to their benefit in the future. I have an agreement with the college to share my findings after finishing my study. The coordinator of the massage therapy program, instructors, and I hope that my findings can improve understanding of teaching methods for students and instructors.

To summarize, my analytical framework departs from language-based SFL theory by extending into the realm of multimodality. As I showed, MDA moves beyond a discourse-centric to an action-based approach that focuses on the nexus of practice as the intersection of social actors, meditational means, and mediated practice in historical cycles. Because every nexus of practice is different, and because MDA links different fields, it functions as a heuristic tool, thereby inviting researchers to include any data set and any tool or set of tools they consider appropriate to analyze social action (provided they follow the constraints of all appropriate methodologies and theories).

To actualize the research potential of nexus analysis, I chose existing gesture taxonomies and methodologies as my starting point to study gesture. However, my own study of gesture goes beyond the types of gestures that have typically been studied and described in the literature, namely mid-air gestures in experimental settings; specifically, I focus on touch gestures in a naturally occurring educational environment. As part of this

process, I need to extend current gesture taxonomies to include new categories of gestures when necessary. In what follows, I describe methodologies used in the field of Gesture Studies and their affordances and constraints for my study. Furthermore, I discuss how I developed my own gesture transcription conventions in response to limitations in current conventions of transcribing gesture. To that end, I utilize modern technology to maximize the expressiveness of gesture transcripts.

3.3 Studying Gesture

3.3.1 Demands of a 21st century world on studies of gesture.

Humans integrate tools in their daily actions and those tools then function as extensions of their bodies and senses, as, for example, Haas and Witte (2001) argue. Thus, we use microscopes and x-ray machines to enhance our vision, we use pen and paper or keyboard and word-processing programs to record our thoughts and ideas, and similarly, we use computers, fax machines, and (smart)phones to communicate with each other. Increasingly, then, communication is channeled through electronic mediums that offer new ways of integrating the different semiotics used to communicate. Accordingly, we produce, send, and receive images and videos; touchscreens utilize gestures and transform them into commands to operate machines.

The development and implementation of new tools enhances our senses and complicates the way we communicate with each other. As a result, it is increasingly important to understand how social semiotics are used and how they function in human communication. In turn, this knowledge can then be used to enhance our interaction with

and through machines. Despite that our means of communicating change so quickly, we still do not fully understand how gesture is used in face-to-face exchanges to transmit embodied knowledge. It is commonly acknowledged that different modes (speech, image, gesture, etc.) have different affordances and constraints; depending on the context and the situation, one mode may be preferable over another. Nevertheless, no mode is more important or more effective than another, and they are all intricately related to each other.

3.3.2 Identifying gestures.

As demonstrated in Chapter 2, through Kendon's Continuum and McNeill's Growth Point theories, gesture, speech, and thought are closely connected, and most gestures co-occur with speech. Therefore, when studying gesture, co-occurring speech cannot be ignored. To study gesture and speech, I follow other scholars' example and videotaped the participants. I then used the videotapes to transcribe speech and gesture. Videotaping a situation is better than tape-recording the speech or simply observing it without any technology because gesture is a complex, visual medium.

For the videotaping itself, I used small, hand-held video cameras; to allow for greater stability and better video quality, I attached the camera to a tripod. However, the small size and light weight of the camera allowed for hand-held use, which in turn allowed for greater flexibility to move around the classroom, when necessary. I decided to focus on the instructor as s/he provided the main part of the lecture, occasionally turning to students as they responded during the lecture or practice massage techniques on each other or interacted with the instructor; thus students at times appear in the tapes.

Once the classroom sessions were videotaped, I identified instances of touch gestures and transcribed speech and gesture. Specifically, I followed Kendon's (2005) method; he proposes that researchers analyze gestural phrases and gestural units, as well as tone units, before identifying how they are related to each other. Tone units correspond to units of discourse meaning and are identified through prosodic features. In other words, tone units correspond to the interaction of words and nonverbal clues, such as intonation.

Gesture phrases correspond to meaningful bodily actions and are identified through kinesic features, that is, the relative movement or stillness of body parts used to gesture. A gesture unit includes the whole trajectory of movement from the moment the gesturing body part leaves its resting position until the time it returns to the initial position from which the movement started. One such gesture unit contains one or more gesture phrases. Kendon defines gesture units and gesture phrases as follows: The actual core or "nucleus" of the gesture that embodies the intended expression is the "stroke." The phase that leads up to the stroke is recognized as "preparation," and the phase that follows the "stroke" is referred to as "recovery." Sometimes, the speaker extends the actual "stroke" by holding the gesturing body part in the position, which is then termed the "post-stroke hold." "Stroke" and "post-stroke hold" usually bracket a semantically complete phrase of speech. That is, the "gesture phrase" then is defined by the following phases: preparation, stroke, and post-stroke hold[15] (if applicable). Every gesture phrase contains only one stroke. All phases of a gesture phrase and the recovery phase are parts

[15] Kendon draws his information from Kita's (1993) dissertation, *Language and thought interface: A study of spontaneous gestures and Japanese mimetics*, to which I had no access.

of a gesture unit. Finally, a gesture unit may contain more than one gesture phrase (Kendon, 2005; Kita, 1993).

As indicated in Chapter 2, gestures possess the following characteristics: First, they are global. Global indicates that the meaning of the parts of the gesture are determined by the meaning of the whole; in contrast, in speech the parts, that is, the words, make up the whole, the sentences. Second, gestures are synthetic. Synthetic refers to the fact that gestures combine a larger surface structure of sentence meaning into one single gesture. Third, gestures are non-combinatoric. This means that a number of smaller gestures cannot be combined into one larger one. As discussed before, a gesture phrase contains only one stroke. Fourth, gestures are non-hierarchical. They are idiosyncratic and personal, that is, they are emerging from context and are different from individual to individual, although similarities can be observed. Finally, as already pointed out, they are timed as being anticipatory of and synchronous with speech (Kendon, 2005; McNeill, 1992).

3.3.3 Gesture-speech relationships.

Kendon (2005) argues that "In creating an utterance that uses both modes of expression, the speaker creates an *ensemble* in which gesture and speech are employed together as *partners* in a single rhetorical enterprise" (p. 108; emphasis in original); in other words, although gesture and speech may express different meanings, the meanings articulated through both semiotics interact in the utterance. Kendon (2005) discusses

numerous ways gesture and speech are related to create the final utterance.[16] The following list illustrates examples of gesture to speech relationships with examples provided by Kendon (2005):

- Referential –Example: "when JJ […] moves his hand forward as if he were leafing through a book of cloth samples as he says 'what with going through reams of curtain material books' his gesture makes reference to actions involved in looking through the curtain material books, which is part of the content of the utterance" (p. 158)
    - Representation "of an aspect of the content of an utterance" (p. 160)
        - Modelling—"a body part is used as if it is a model for some object" (p. 160)
        - Enactment (or pantomime)—"the gesturing body parts engage in a pattern of action that has features in common with some actual pattern of action that is being referred to" (p. 160)
        - Depiction—"the gesturing body parts—which are almost always the hands,[…]--engage in a pattern of movement that is recognized as 'creating' an object in the air" (p. 160)
- Pragmatic—"*pragmatic* functions […] any of the ways in which gestures may relate to features of an utterance's meaning that are not a part of its referential meaning or propositional content" (p. 158; emphasis in original)

[16] For a more detailed discussion see Kendon, 2005, pp. 158-283.

  - Modal function—"the gesture alters in some way the frame in terms of which what is being said in the utterance is to be interpreted" (p. 159)
  - Performative function—"when [the gesture] is used to indicate the kind of speech act or interactional move a person is engaging in" (p. 159)
  - Parsing function—"gestures […] punctuating the spoken discourse, or as if they are marking out its different logical components" (p. 159)
- Interactive or interpersonal functions—"for example, the use of gestures as a way of indicating to whom a current utterance is addressed, to indicate that a current speaker, though not actually speaking, is nevertheless still claiming a role as speaker (still 'holding the floor'), and gestures that regulate turns at talk, as in raising a hand to request a turn, or pointing to someone to them a turn, as happens at formal meetings or in the classroom." (p. 159)

Summarizing, Kendon (2005) observes that gestures occur "conjunction with spoken expressions, at other times as complements, supplements, substitutes or as alternatives to them" (p.1). In other words, speech is not superior to gesture; depending on each individual situation, speech, gesture, or some other mode will play the major role in the representation of information.

According to the nexus of practice, I must acknowledge that speech and gesture build an ensemble and humans utilize both when communicating. Therefore, when studying the use of gesture, I analyze speech alongside the gestural data. In what follows, I provide a more in-depth discussion of my gesture-speech transcription methodology.

3.4 Types of Gestures

3.4.1 Gesture theory.

Bodily movements are classified as gestures and non-gestures. According to Kendon (2005), a movement is considered a gesture when it is meant to provide information, that is, it functions as utterance or part thereof. Utterance to Kendon is any action or set of actions, which is regarded by the participants as interactional movement. Kendon further describes movements that are generally not regarded as gestures. These movements include involuntary movements (i.e. touching one's hair or face), movements necessary to participate in an interaction (i.e. stepping closer to better hear the other person), or practical actions (i.e. drinking, smoking). However, as Kendon points out, this classification does not always hold true. Movements typically regarded as gestures might not be perceived as such and movements typically classified as an action, which are not a gesture, might turn into a performance and therefore be regarded as gesture. As I discuss later in chapters 5, 7, and 8, these exceptions are important to my study because I have found numerous examples in my data set of movements that Kendon would consider practical actions as is; but since they turn into performances, they then become gestures.

Once I classified movements as gesture, I then grouped them according to research interests and specific questions. As already discussed in the second chapter, Kendon's Continuum organizes different types of gestures in their relation to accompanying speech. The identified gesture types are (1) gesticulation, (2) speech-linked gestures, (3) emblems, (4) pantomime, and (5) signs. Gesticulation is the most frequently observed type of gesture in daily use, and includes hand and arm movements

but also the head and other body parts. Gesticulations are spontaneously produced by most humans when they speak. Of all the identified types of gesture, it is the least speech like. Speech-linked gestures are part of the sentences themselves. They accompany the words and fill a grammatical slot within the sentence and only gesture and speech together complete the sentence structure. Emblems are conventionalized movements, such as the "OK" sign, formed through touching the fingertips of thumb and index finger in a ring like form. In contrast, pantomime is a sequence of movements produced without speech and used to narrate a story line. Finally, signs can be found in sign languages, such as the American Sign Language and are the most language-like. Signs are comparable to lexical items in a spoken language and follow linguistic patterns, such as grammar and morphology (McNeill, 2005, p. 5). In the following section, I discuss how I apply this theoretical taxonomy to my actual data.

3.4.2 Practical application.

Based on the method described above, I began with transcribing my videorecordings. To that end, I first watched the tapes to identify movements that involved touch, since my specific interest is in touch gestures and not mid-air gestures. As Chapter 5 indicates, I find four ways in which touch becomes part of a gesture. Once a movement was found that incorporates touch, I applied Kendon's definition of gesture. Namely, I questioned (1) if a movement was performed under voluntary control, for example, movements which are not hair pattings, pushing back of glasses, scratching of the nose, etc.; (2) if the movement was done for the purpose of expression, thus is contributing to the content of the interaction rather than, for example, stepping closer to

hear better; and (3) if the motivation of the movement was not in the service of a practical action, for example, drinking, writing, and providing someone with a massage. Only if these three elements were present, did I consider a movement a gesture. For reasons of practicality, I was unable to show every taped movement to the participants and ask them if they too believed that the movement was a gesture. Therefore, this process is based on certain assumptions and interpretations, derived from the context of each particular situation.

However, I had two undergraduate researchers help me transcribe the speech of identified touch gesture situation. To that end, they first determined an appropriate situation and then transcribed the speech. We then met and discussed why they transcribed particular scenarios. We agreed on almost all situations transcribed. Variations in understandings of transcripts thus typically differed only in the length of a situation, that is, if a certain situation should be transcribed as one or two scenarios. This might not be a surprising outcome, since Kendon (2005), referring to numerous studies, concludes that

> The intentionality of an action is something that is directly perceived. That is, it is the quality of the action as intentional (not the specific intention, necessarily) that is directly perceived. In other words, an action that is gestural has an immediate appearance of gesturalness. This means that a movement having this appearance will be discriminated and recognized as such directly. (p. 15)

In other words, humans recognize movements as gestures naturally, without further training. Therefore, the undergraduate researchers and I were able to agree on which

movements constituted touch gestures and which did not. Deciding when a situation began or ended, however, was a more subjective act, and, therefore, we had disagreements, which were easily solved by a discussion.

Once I separated movements from gestures, I identified the beginning and end points of the specific situation in which they were embedded. To that end, I determined discourse units. In other words, I determined the parts of the discourse that in themselves treated one topic. Here, I use the terms topic or situation in a rather lose way. When transcribing a gesture, I tried to provide some context on the situation that would help me to categorize the gesture and understand its function within the utterance. Such a situation might entail more than one gesture unit if they occur in close temporal proximity.

As the preceding discussion demonstrates, understanding a gesture and its meaning requires more information than the gesture alone. Therefore, it was important that I included sufficient context for the gesture to understand fully its role and potential within the situation observed. To me, it was not important that transcribed discourse units were of similar length or contained a specific amount of gestures. Instead, I tried to provide enough context for the gesture(s) observed to be understood as they happened at that moment in the classroom. For example, every class I observed covered one or more major topics. These topics are comprised of smaller content units, which again can be divided into even smaller units, and so forth. The smallest units that I transcribed spanned from a few seconds to 15 or even 20 minutes and beyond. Sometimes the speaker would go into an extended gesture hold while maintaining the touch; at other times, the speaker

would produce a number of shorter or longer touch gestures in quick temporal proximity which would then result in a longer transcription span.

Once I identified a situation with one or more gesture units, I transcribed the speech. Here I followed speech transcription conventions as commonly found in the literature (see Appendix). I transcribed the speech as follows: First, the actual words were transcribed. If the speaker used a wrong word, false grammatical form, a false start, etc. the instances are transcribed as produced by the speaker. However, I used proper orthography to transcribe the speech and did not account for dialect or accents that may produce pronunciations different from General American English. Then, I added intonations, pauses, emphasis, overlaps between different speakers, etc. In addition, date, tape number, and start and end time of a situation were noted as well as the speakers involved.

After transcribing the speech, I followed by transcribing the corresponding gesture. As my heuristic requires, gesture transcriptions, similar to speech transcriptions, must be adjusted to the needs of the research. For example, to transcribe speech, one might choose to transcribe accent-related pronunciation patterns, or, as I did, follow proper English.

Few authors discuss in detail how to transcribe gesture. Kendon (2005) acknowledges that for the purpose of his book, gesture transcriptions follow "a highly simplified method" in the hopes that they are "immediately readable" (p. 362). For example, ~~~~ indicates the preparation phase of a gesture, and **** the stroke phase. Then, the symbols are aligned with the corresponding transcribed speech to show the

relationship between speech and gesture. In addition, Kendon uses simple pencil-style drawings to illustrate visually the aspect of a gesture he emphasizes in his discussion thereof.

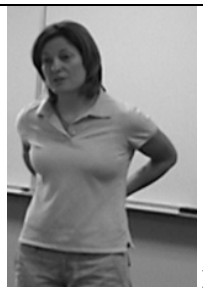
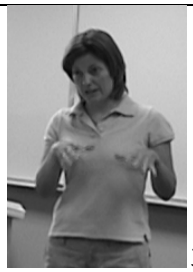
Norris (2004a) takes a more visual approach. She uses sequences of stills to illustrate how a situation develops in a timely manner and imposes co-occurring speech as text. To adjust for prosody and emphasis in Norris' practice, the text appears in a wave-like pattern with emphasized words in a larger font size. In addition, arrows indicate movement; for example, down and up arrows indicate a beat gesture. Numbers illustrate the length of a certain action, for example, "3" stands for a three second duration of the performed beat gestures (pp. 77/78). Unfortunately, Norris neither explains how she decides which moments to portray in a still image when transcribing a particular situation, nor does she discuss what particular speech segment correlates to the image. However, her use of successive photographic stills provides much more detail than Kendon's use of simplistic drawings and is more easily understandable for the reader than Kendon's use of signs to mark gesture phases.

Based on my purpose, I determined that neither of these transcription conventions was feasible for my study. Using my nexus of practice heuristic, I therefore developed my own gesture transcription conventions by extending those of Kendon and Norris. Because gestures are a visual mode, they are most easily perceived in that same mode. Therefore, I decided to use photographic stills, taken from the video takes, to transcribe gestures and illustrate particular moments frozen in time. Stills had the advantage over drawings of being more precise. Furthermore, with the help of current technology, they

were also more easily obtained than creating separate drawings. Current video software also allowed me to slow down the video to match speech with co-occurring gestures and save chosen video frames as stills. While taking the stills and matching them with the co-occurring speech, I tried to be as precise, yet also as economical as possible. To that end, my primary focus was on obtaining a still of the gesture stroke, since the stroke is the part of the gesture that contains the actual visual information of the gesture. Furthermore, I attempted to illustrate the situation as captured via video as closely as possible. I also provided stills of surrounding gesture phases or instances where no gesture occurs, if these events were significant for the situation transcribed. In a table format, I matched stills with the speech. Additional text was added to the still if the image required further information that could not be easily displayed in a still image, such as "swift up and down movement." Figure 3.1 demonstrates what a transcript looks like:

Figure 3.1. An example of a gesture—speech transcript. (071009T1S16)

Time	Speaker	Speech	Motion
0:36:40	Instr.	And they lay on one si:de, (.) and it	 130

		exposes both sides, which you can really {o:nly can get good work on}[17]	 187 {circular motion with LH}[18]
		whichever side is on to:p, and then they turn to the other side.	 337
0:36:49			

I think a caveat is in order here: Transcribing a gesture is an interpretative act; the transcription of a gesture does not equal the gesture itself. Therefore, I attempted to portray gestures and speech as precisely as possible as I observed them in action but was never able to capture the full extent of the speech-gesture utterance.

To code my transcribed data, I applied current gesture taxonomies as proposed by Kendon (2005) and McNeill (1992). In the beginning, I determined if a gesture was a gesticulation, speech-linked gesture, emblem, pantomime, or sign. According to current gesture taxonomies, gesticulations can be divided further into iconic, metaphoric, deictic and beat. Iconic gestures are pictorial; they represent a particular object in the world and can indicate its shape or size. For example, when a speaker talks about a box and

[17] Speech between {} has a slightly different gesture, often a motion, than displayed in the still and is further explained through text in another set of {}.
[18] Text in {} explains additional information to the gesture depicted in the still and is limited to only parts of the corresponding speech. The speech is marked by a second set of {}.

indicates its size and shapes through "drawing a box" mid-air, s/he uses an iconic gesture. Metaphoric gestures are similar to iconic gestures. The difference between the two is that metaphorical gestures picture abstract meanings as objects. An example can be found when a speaker discusses cartoons as a genre and produces a similar "box drawing" as described above. The genre of cartoon is not an actual box but the shape is a metaphorical representation. Deictic gestures, as iconic and metaphoric gestures, are representational gestures but not pictorial. They are movements, often with hands, that point at real or metaphoric spaces, objects, people, etc. Finally, beats are neither pictorial nor representational. They are called beats because they are similar to someone beating musical time by moving hands, arms, or other body parts in a rhythmic up and down movement. On the level of discourse, beats signify that the speaker relates different parts of his/her speech to each other.

Furthermore, gesture carries information about the narrative structure of the discourse that is not obvious in speech. For example, narrative itself is accompanied by iconic gestures that can either take on the Observer View Point (O-VPT) or the Character View Point C-VPT (Sauer, 1999). The C-VPT signifies more involvement with the story, whereas the O-VPT signifies removal and analysis of the events. Meta-narrative is accompanied by metaphoric or deictic gestures, and para-narrative is accompanied by deictic gestures or no gestures at all. Beat gestures indicate a shift between the para- and meta-narrative levels of a discourse (McNeill, 1992).

According to nexus analysis, to engage in the nexus of practice, the researcher needs to determine which actions are essential to the participants' lived experiences and

focus his/her research accordingly. To understand what gestural practices were crucial to the participants of my study, I analyzed every known type of gesture. Although most researchers focus on gesticulation when studying gesture, I believed I needed to take into account all types of gesture that appeared. Only then was I able to determine what their use was in the communicative process—that is, if they were essential to the participants' lived experiences, and, ultimately, what role they played for rhetorical delivery. In addition, current gesture taxonomies draw from mostly experimental settings where participants narrate to others often only with minimal feedback and without physical interaction or manipulation of objects, tools, etc. In contrast, my study was situated in an actual classroom. Interactions between participants were not prompted but occurred naturally and spontaneously. Only when attributing currently identified types of gestures, was I able to determine if those are also applicable to and sufficient for my data set.

One last issue that needs to be addressed is the one of reliability. As discussed earlier, two undergraduate researchers helped me identify instances of touch gesture and transcribe the speech of those situations accordingly. In contrast, I was the sole researcher transcribing and coding gestures. As Armstrong, Gosling, Weinman, and Marteau (1997) discuss, scholars do not agree on the question of reliability in qualitative research. While it is widely acknowledged that research techniques should be discussed transparently, presumably so that others could potentially repeat the study, different opinions on inter-rater reliability exist. In their empirical study, Armstrong, Gosling, Weinman, and Marteau find that different researchers were in "concordance at a level of situating

themes within a wider framework" (p. 605). While the researchers agreed closely on the basic themes, they "packaged" (p. 597) these themes differently. The authors explain that

> all analysis is a form of interpretation and interpretation involves a dialogue between researcher and data in which the researcher's own views have important effects […] Nevertheless, subjectivity does not necessarily mean singularity: the vies of the analysts in this study were socially patterned, and this determined their interpretations. (p. 605)

In other words, while all researchers interpret raw data from a unique social and personal background, researchers within similar social frames will, very likely, interpret themes in the data similarly but will differ in the way they package those themes as they discuss them.

These findings help me explain differences and similarities my two undergraduate researchers and I found because of the social patterns we studied. On the other hand, we packaged them differently. Furthermore, Armstrong, Gosling, Weinman, and Marteau's study's finding allows me to argue that it is likely that additional coders would have interpreted gestures similarly to the way I did. Although using additional coders for my data would allow me to consider my data interpretation more "objective" than not having them, that circumstance should not take away from my findings.

3.5 Conclusion

To reiterate and recapitulate, following Halliday's (1977, 1978) original premise, that language is a social semiotic system, and those who extended his theory into semiotic systems other than written or spoken language, I acknowledge that semiotic

systems depend on their function in human communication. Therefore, before questioning the role gesture plays in human communication, I first must understand how it functions and how it is structured generally.

MDA allowed me to link gesture taxonomies with SFL and multimodal extensions thereof. To that end, my study begins by applying current gesture taxonomies. I determine if an observed gesture can be categorized under any known type of gesture, which include gesticulation, speech-like gestures, emblems, pantomime, and signs. If the gesture is identified as a gesticulation, I test whether it fits in any of the known subcategories, namely iconic, metaphoric, deictic, and beat. If a gesture cannot be accounted for by currently existing taxonomies, I depart from known definitions of gesture types and explore how the encountered gesture is similar to and different from known types. I consider its form and function. In other words, I acknowledge if the gesture co-occurs with speech, if it has any linguistic properties, and if it is conventionalized. Furthermore, I examine its relation to speech and information encoded in the gesture. Finally, I define and classify the new gesture to then assign it a place on Kendon's Continuum.

I hope my methodology clarifies how gesture is currently understood. By developing my methodology through the nexus of praxis heuristic, I also hope that my study helps scholars better categorize and use current gesture taxonomies and, in so doing, better account for the way gesture is used in complex situations.

Having traced the historical relations of my methodology from Halliday's focus on print and spoken language to the extension of his theory to include multiple modes in

the definition of language, I have also discussed how mediated discourse analysis allows me to use nexus analysis as a heuristic tool to connect linguistic theories to gesture taxonomies to study gesture as a social semiotic. Finally, I have discussed current definitions of gesture and gesture taxonomies and how I have applied these to my research. From here, I move into my next chapter, which discusses the data set.

CHAPTER 4

Data Collection

With my methodology described, I now detail my process of data collection. First, I provide insight into my participants, including details about my sample of students and instructors. Next, I discuss the set up of the classroom and the structure of the class meetings observed. There, I also include a discussion of videotaping as primary source for data collection. Finally, I sketch an overview of the main topics covered during the class sessions I attended.

4.1 Participants

To explore the use and role of gesture in the transmission of knowledge, I collected my data at a Massage Therapy program at a small Midwestern college. Specifically, my data comes from one group of students and their three instructors who, respectively, attended and taught one section of the Massage Therapy course during the Summer and Fall semester of 2009.

The Massage Therapy course was recommended to me by the Massage Coordinator of the program. The course "introduces students to Massage Therapy as a health care profession"; students study "the history and benefits of Massage Therapy and Massage procedures necessary to complete a full-body, therapeutic massage" (Stark State

College of Technology, 2007-2009, p. 207). The course falls within a series from Massage Therapy I through V; in other words, students have to attend successive parts of Massage Therapy every semester. The class I observed attended Massage Therapy II and III during the Summer and Fall semester respectively.

My primary source of data collection was obtained by videotaping the class. Students and instructors who agreed to participate in the study were able to choose between two different forms of consent: basic and full consent. The basic form of consent allowed me to include their image in stills that I created when transcribing gesture, and, ultimately, allowed me to include their image in the current study and future publications; but it did not allow me to analyze speech and gesture they produced. Thus, I was able to videotape but not analyze, for example, in situations in which the student would be standing next to a participant who gave me full consent, or while that student was worked on by a participant who provided me with full consent during a hands-on massage session. Furthermore, this type of basic consent did not permit me to interview the students or use any sort of comments the instructors made on their learning. Participants who gave me their full consent agreed to being videotaped and allowed me not only to analyze their speech and gestures but also to include those analyses and their image in the current study and future publications. Moreover, they consented to being interviewed and allowed me to use any feedback with which they provided me.

For the Summer semester, I obtained full consent from 12 students and for the Fall semester from 17 students. Of the 17 students from the Fall semester, 12 were the same who had given me consent in the Summer. Three students were new to the class,

having switched from another, and two students had been in the class during the Summer and now gave me full consent. In addition, I obtained basic consent from the remaining five and three students during the Summer and Fall semester respectively.

In addition to the students, all three instructors who taught the class during my observations gave me full consent. However, I decided to limit my analysis of the instructor who was the primary teacher of the class. This decision was based on the following incidents. One day, one of the other two instructors walked unannounced into the classroom while the students were practicing massage techniques in the back of the room. She excitedly interrupted the class in session, sharing a new technique including a Chinese porcelain soupspoon, about which she recently had learned. Although the students and the first instructor, who was in charge of the class at the time, enthusiastically greeted her demonstration, the whole interaction between the two instructors and students lasted only about two minutes, with her demonstrating for about one minute. Because this very short episode prevents me from drawing any conclusions about the ways this instructor teaches and interacts with the students, I do not include her in my analysis.

The third instructor substituted during two of the six class meetings I recorded. When he introduced himself to the class during the first meeting, it became clear that he had met some of the students during other substitute class meetings in different courses they had taken, but the majority of the students had never met him. I believe that this circumstance led the class to react quite differently to him than to their regular instructor. For example, while students were usually engaged and active during a class with their

regular instructor, asking questions and offering personal stories and experiences that often helped them illustrate a point; they were distinctly quieter during class sessions with the substitute instructor. During the first session, no student offered a personal story. While the class seemed to be more at ease asking more questions during the second meeting, this might have also been a matter of the topic at hand, that is, the instructor explicitly preparing them for an upcoming final exam.

In addition, the substitute instructor repeatedly mentioned that he produced a greater number of gestures than usually, to support my study. I have no way of comparing his observed behavior with teaching situations when he is not observed. In contrast, the primary instructor of the class walked by me and the camera after about one hour of teaching during the first class session I observed and commented that she suddenly realized again that she was being videotaped (see Chapter 3). On this basis, I can assume that she was not only more familiar with the students (and they with her), but that she was also more at ease and therefore more natural in her speech and gesturing. I determined thereby that the interactional differences between students and substitute instructor as well as his (presumably) changed behavior in front of the camera limited my insight into natural interactive speech and gesture patterns. Accordingly, I restrict my analysis to the primary class instructor.

4.2 Collection of Materials

As already mentioned (see Chapter 3), my main source of data collection came from videotaping instructor and students. Because gesture is a complex, visual medium, I believe that only videotaping allowed me to preserve the visual complexities of the

situations observed. While videotaping, I also took additional fieldnotes. Furthermore, during breaks, as well as before and after class, I talked with my participants about their understanding of massage therapy, and how it is learned and taught, what expectations the school and the instructor have for the students, and what students and instructors thought about each other and their respective learning and teaching styles. Finally, I had access to the textbook and workbooks used in class, followed the instructor's PowerPoint presentations and whiteboard writings, saw an instructional movie with the class, and observed how objects such as plastic models of (parts of) the human body, heat lamps, and ice packs were included in the class instruction.

I videotaped four class meetings during the Summer semester and two during the Fall semester. Because of technical difficulties that resulted in unusable audio, I was able to use three out of the four classes taped during the Summer and both classes taped during the Fall. Summer classes met from 8:30 a.m. to 2:30 p.m. once per week, and Fall classes from 8:30 a.m. to 4:30 p.m., also once per week. After subtracting break times and quizzes, which I did not videotape, I collected a total amount of approximately 21 hours of recorded class time.

Furthermore, because I excluded material taped involving instruction by the other two instructors, my analysis focused on approximately twelve hours of videotaped material. Following my methodology, I transcribed situations that involved gestures that included touching objects or people rather than mid-air gestures. I transcribed a total of 275 situations, which include at least one touch gesture, but often more, and run from less than one minute to more than 20 minutes in duration.

4.3 Learning Environment and Structure of the Lessons

The classroom itself is set up like many, with an instructor's desk and computer in the front of the room, a whiteboard and screen (that can be pulled down when needed) on the front wall, facing the students. The students' desks are then arranged in three long rows, facing front. In addition, the back of the classroom provides sufficient space for students to put up massage tables when needed. Cabinets line the back and one sidewall of the classroom, these holding towels, massage lotions, and oils, etc. Extra tables on the sides of the room hold plastic models (of parts) of the human body. A sink in the back of the room completes the learning environment.

Usually, during the morning of the class session, the instructor lectured on one or more topics, allowing the students to participate in the discussion. Then, the afternoon was typically spent with the instructor demonstrating massage techniques, often in close relation to the topic(s) discussed in the morning; students then practiced the new techniques with each other. For example, if the topic of the lecture included pre-natal massage or trigger points, the instructor demonstrated pre-natal massage or trigger points, and the students would practice on each other accordingly.

The lecture took place in the front of the room with the students seated across and facing the teacher, and the instructor navigating the space before them, engaging with the whiteboard, computer, and PowerPoint presentations, the textbook, the students, and so forth. As expected, the instructor managed the major part of the lecture but also involved students in the discussion. For example, the instructor may ask students to recall previously discussed material or ask about their experiences with a certain situation; or

s/he may ask them to imagine how a certain situation could play out (e.g. the intake process of a new client). During sessions taught by the primary instructor, students were comfortable enough to provide narratives of their own experiences without the instructor's prompting them to do so. Furthermore, all instructors encouraged students to ask questions.

4.4 Videotaping Students and Instructor

Because the instructor covered the major part of each class session, I decided to focus mainly on her/him. I put the camera up on the side of the classroom. First, this allowed me access to the instructor with better lighting and lesser zoom; as a result the recorded image quality was better. Second, the position also allowed me to turn the camera toward the class, and, therefore, to capture some of the students' engagement with the lesson. However, this set-up prevented me from always capturing a (uninterrupted) visual of the students when interacting with the instructor; yet, at the least, I was able to audio record the exchanged speech. For this part of the filming, the camera was mounted on a tripod for steadier images.

When the class moved to the back of the room to participate in massage technique demonstrations and hands-on practices, I usually dismounted the camera from the tripod for greater flexibility. During a demonstration by the instructor, students grouped around the massage table. The instructor then navigated around the table with one of the students as "prop" on whom to demonstrate. Holding the camera by hand allowed me to follow the instructor around and provided me with different angles. Similarly, when students practiced on each other, the hand-held camera gave me the mobility to catch students and

instructor from different angles. Furthermore, this set-up enabled me to follow the instructor around when s/he commented on students' practices, advised on the execution of techniques, and answered questions. During hands-on demonstration and practice sessions, students were more actively engaged with each other and the instructor than during the lecture part of a lesson. This dynamic allowed me to capture more student-student and student-instructor interactions. When the instructor was engaged with a student who had provided me with full consent, I usually videotaped the interaction that took place; if the instructor was engaged with a student who had not provided me with full consent or when the instructor was primarily watching the students without direct engagement, I videotaped interactions of students who had provided me with full consent.

Although I believe that videotaping is the best possible way to capture gesture and speech, my use of one video camera was not. I often had to make on-the-spot decisions about what to focus on; while these decisions allowed me to focus on specific aspects of the interaction, I was never able to fully capture everything that happened. However, no researcher is able to capture, observe, and note everything that happens in any given situation. I still maintain that my large data corpus provides me with a vast amount of information to back up my findings and conclusions.

4.5 Learning Massage Therapy

Although the first element that comes to mind about massage therapy may be its techniques, studying the subject is much more complex. According to the State Medical Board of Ohio regulations, an individual applying for a massage license must meet, among others, the following requirements:

1. The individual must have received instruction on Massage Therapy for a period of a minimum of nine months and a minimum of 750 clock hours at an approved Massage Therapy school.
2. Subjects included during the course of instruction must be of practical and theoretical nature, and include Anatomy, Physiology, Pathology, Ethics, Clinical program and Hygiene (State Board of Ohio).

Accordingly, the students receive more than instruction on massage techniques. For example, courses in anatomy and physiology provide students with essential knowledge about the structure and function of the human body. This understanding is crucial if students want to treat clients with certain ailments properly. On a more basic level, students need to understand how certain muscles function, to which bones they are attached, and how the body works as a whole. This knowledge allows massage therapists to understand how different body parts affect each other and how a massage technique can support or counteract these relationships. In addition, students also need to understand how to run their business.

Although the college offers specific classes for business practices, students are introduced to basic principles of interacting client interaction and running a successful business throughout the massage therapy course. For example, when practicing on each other, students are encouraged to treat each other professionally and respectfully. The instructor will also provide information on where to buy equipment, and how much it costs; she reminds students to collect receipts for tax returns. The instructor is well aware

of the curriculum students have to complete and occasionally referred to other courses' content and materials with which students were either already familiar or would be encountering in the future. She frequently referred to material that was covered during preceding sections of the Massage Therapy Course sequence or would be covered in subsequent semesters.

Specifically, the classes I videotaped covered, among other things, the following topics: the consultation; classification of massage movements; massage in medicine; neurological laws and Pfluger's Law; hydrotherapy and heat therapy; prenatal massage; and trigger point massage.

4.5.1 The consultation.

Students were introduced through a lecture and later practiced the intake with each other. This lecture discussed what questions to ask about a client's medical history, his/her previous experience with massage, his/her likes and dislikes of being touched/massaged by someone, and paperwork that needs to be completed by client and therapist, etc. The instructor emphasized students' professional behavior, such as their ability to listen to their client's story and to gather useful information through this; she also covered techniques to lower new client's anxiety that may be caused because massage involves at least a minimal undressing in front of a stranger.

The instructor further made students aware that they are able to gather information about a client through his/her body language, such as limping, and that the observed body language may not be all-revealing; therefore, the therapist's questions need to substitute for missing information. For example, a client may be pointing at the

right side of his/her back when talking about back pain but in fact might have pain on both sides of the back.

Repeatedly, students and instructor acknowledged and stressed that massage is a non-sexual interaction but that some clients may assume instead that massage involves sexual favors. Therefore, a massage therapist always needs to be especially careful in how s/he presents herself/himself in public. The instructor illustrated her point by telling the story of a former student who advertised in bars and was then surprised when people called her in the middle of the night for a "massage."

4.5.2 Classification of massage movements.

This lecture centered on different types of massage techniques, such as friction (the therapists uses the balls of the thumbs, fingertips, knuckles or elbow to penetrate deeply into the tissue by moving the muscles against the bone in small circular movements), chucking (the therapists uses one hand to steady the limb while moving the flesh firmly up and down along the bone with the other hand), shaking (the therapist performs vigorous, vibrating movements), percussion (the therapist applies both hands alternately in rapid succession to create a series of brisk, striking actions), and so forth.

The instruction integrates readings from the textbook, a PowerPoint presentation, demonstrations by the instructor, and students practicing different techniques on each other. For the practice parts of the class, students are reminded and encouraged to do an intake with their partners, as discussed and practiced during the last class meeting.

Interwoven with the discussion of the different techniques are others on touch and its role in society (for example, the U.S. is a low-touch society, most touch adults receive are discomforting touches in the hospital environment, such as drawing blood), and reiki as a non-touch form of therapy.

4.5.3 Massage in medicine.

The main part of this lecture involved defining, comparing, and contrasting allopathic (Western medicine), alternative (massage, acupuncture, etc.), and complementary (a combination of allopathic and alternative) medicine. When focusing on the place and role of massage in this model, the instructor stressed that scientific research in Complementary and Alternative Medicine (CAM) increases the acceptance of such therapies within the (Western) medical community. The lesson emphasized the struggle of alternative medicines to be acknowledged as effective by the allopathic community. Interestingly, during the course of the class it became clear how members of the alternative community (including massage therapists) often see themselves on par with, if not more effective than, Western medicine, while at the same time struggling to be acknowledged as "useful" therapists.

The class discussion further evolved around questions of record keeping when working in an integrative system, that is, massage therapists and practitioners of other forms of alternative medicine working hand-in-hand with doctors involved in Western medicine in and outside of hospital settings.

Finally, the instructor emphasized that massage provides relief from the feeling of institutionalization for a patient within a hospital setting. Massage can offer a positive touch in an environment where most touch is unwanted by the patient or that aggravates the empathetic nervous system, such as drawing blood and IVs.

4.5.4 Neurological laws and Pfluger's Law.

The class watched video about Pfluger's Law and discussed Pfluger's Law and other neurological laws that account for the spread and development of chronic pain in the body.

4.5.5 Hydrotherapy and heat therapy.

The class explored hydrotherapy, or treatments that involve water; later, the instructor also included an infrared lamp for heat therapy. First, the instructor incorporated a PowerPoint presentation into the instruction. Then, to illustrate some of the uses, students observed, and some tried, a hydrocollator, ice packs and an infrared lamp.

4.5.6 Prenatal massage.

During a session on prenatal massage, students learned how to perform a massage on a pregnant client. Typically, the exploration of the topic began as a lecture and was then followed by an instructor demonstration and hands-on practices by the students among themselves. Interestingly, the instructor not only discussed massage techniques that are especially useful and beneficial but also spent a considerable amount of time on draping techniques to guarantee a pregnant client's decency and comfort. Furthermore,

she continuously reminded students to acknowledge a pregnant woman's needs that differ from a regular client, for example, a frequent need to shift positions, different positions, and frequent bathroom breaks.

4.5.7 Trigger point massage.

For the instruction on trigger point massage[19], the instructor included trigger point charts as a visual aid. The charts picture schematics of human beings, muscles, and corresponding trigger points.

The instruction began by acknowledging the work that goes into composing an anthology of trigger points, then moved on to discuss the underlying mechanical functions of muscles and their contribution to the development of trigger points; after moving on to the charts and visualizing the position of trigger points in respect to effected muscles, she finally demonstrated and students then practiced how to locate and treat trigger points.

Although students often struggled initially when performing a new technique, they did not seem to hesitate to identify a tense muscle[20]. Once a student even mentioned that she could not understand why clients are amazed that someone can feel the difference between a tense and relaxed muscle. To the student, it seemed rather peculiar how someone could *not* feel the difference. However, during the practice of trigger point techniques, students struggled to identify trigger points and often asked the instructor what a trigger point feels like. The instructor then identified one and guided the student's

[19] Trigger points are sensitive points in taut bands of muscles, which often can be identified as nodules. Trigger points refer pain to related muscle areas and palpating the nodules will relieve the pain.
[20] A tense muscle is different from a trigger point because a trigger point refers to pain whereas a tense muscle does not.

hand to find it. One reason that students are more familiar with tense versus relaxed muscles may lie in their ongoing practice of massage techniques on each other, friends, family, and at the clinic. It is, however, the first time for them to identify and treat trigger points. Chapter 8 of my study provides an in-depth analysis of the ongoing interactions in the learning and teaching process during the instruction of trigger point massage. The discussion aids my analysis of the interplay of different modes and modalities that learners and instructor employ in the classroom.

4.6 Conclusion

During the course of the instruction, different modes and modalities are employed. That is, students use textbooks that are composed of images and writing, the instructor uses PowerPoint presentations, accompanied by speech and gesture. Students and instructors communicate via speech and gesture. At times, instructors use props to support their explanations. These include but are not limited to the use of an infrared lamp, the inclusion of a plastic skeleton and plastic mannequin displaying the muscles in the human body, charts with schematics, and movies. Finally, the instructors demonstrate techniques on students, and students practice them on each other. In addition, students are required to fulfill 40 hours at the massage clinic, working on random clients, 10 hours in the community, for example during the July 4th race, and practice 50 massages (at a maximum of five times per person) on friends, family, etc. Although this is not a requirement to pass the program, students are encouraged to experience different massage therapists and different forms of alternative medicine, such as acupuncture, reiki, and chiropractor.

In sum, the instruction of massage is genuinely multimodal. Students move from a text based lecture, to a visual demonstration, to a hands-on experience. Interestingly, the final licensing exam is a multiple choice test, forcing students to translate their acquired embodied practices back into written text. Observing the process of turning a layperson into an expert, here a massage therapist, demonstrates that communication and learning are not based on language alone but include other modes, such as images, sound, and gesture.

As Iedema (2003) points out, resemiotization, that is, the translation of semiotics from one mode into another, is a common practice as social processes unfold. Although scholars are well aware that every mode has its affordances and constraints, it is as yet unclear why and how individuals or groups choose specific semiotics over others in a specific situation. As different semiotics are selected to transmit information between interaction participants, meaning is never directly translated from one mode into the next. "Transportation between different semiotics inevitably introduces a discrepancy that 'goes or points beyond' (metaphorical) the original" (Iedema, 2003, p. 47). In other words, it is often impossible to find a "semiotic equivalent" (Iedema, 2003, p. 47) when transferring meaning from one mode into another. Every mode introduced will add or take away from the meaning conveyed in the original form; it thereby helps or hinders the representation of knowledge.

In this study, I am specifically interested in the use and role of gesture in the representation of knowledge. Although I am aware that the different modes humans employ to communicate are intricately linked, I unfortunately do not have the time and

space to explore all the connections and events included in the event of a resemiotization. I focus my exploration on gesture and gesture—speech links. The following chapter details my findings, before the next three chapters discuss them further. After detailing my results in Chapter 5, I move on to describe new gestures I identified (see Chapters 6 and 7). Finally, based on the example of trigger point massage instruction, I consider the intersection of the different modes and modalities employed in the classroom (see Chapter 8).

CHAPTER 5

Results

With my data and methodology discussed, this chapter's goal is to display my findings. After discussing the different gesture types which I identified according to current gesture taxonomies, I describe gesture variations of currently acknowledged gesture types. Finally, I turn to gestures which cannot be accounted for with current taxonomies.

5.1 Identifying Touch Gestures

According to my methodology and because my specific focus in this study is on touch and not mid-air gestures, the first step of my analysis involves identifying movements that can be classified as touch gestures. I have identified four ways in which touch becomes part of a gesture. (1) The first type occurs when humans incorporate objects without changing their appearance or function, for example, when the instructor speaks about a homework assignment and uses the actual homework assignment as a referent when waving it in front of the class (see Figure 5.1); (2) A second type happens when the speaker manipulates an object that s/he discusses, for example, to demonstrate its function. For instance, when the instructor demonstrates the use of an infrared lamp, she shows the different ways the arm of the lamp can be moved up, down, and sideways

(see Figure 5.2); (3) In a third type, people touch their own bodies. Involvement of the speaker's body happens when, for example, someone mentions a shoulder pain and touches his/her own shoulder simultaneously (see Figure 5.3); and finally, (4) a fourth type of touch gesture occurs when the speaker touches someone else's body, for instance, when the instructor demonstrates massage techniques on a student to the class (see Figure 5.4).

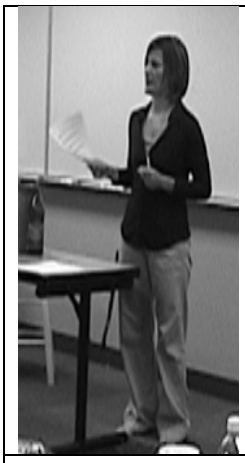


Figure 5.1. Incorporation of an object into the gesture without changing its appearance and/or function. (061209T1S3[21])

Figure 5.2. Incorporation of an object and thereby changing its appearance and/or function. (062609T4S7)

[21] Every transcribed situation receives a unique number composed of the date of the recording, the number of the tape it was recorded on and the number of the situation from that specific tape in chronological order. For example, 061209T1S3 refers to an incident recorded on 06/12/09 on the first tape, being the third situation I transcribed.

Figure 5.3. Incorporation of own body into gesture. (061209T3S20)

Figure 5.4. Incorporation of another person's body into gesture. (061209T4S7)

5.2 Identifying Different Gesture Types

After identifying the touch gestures, I then analyzed them by applying gesture taxonomies as compiled by Kendon (2005) and McNeill (1992, 2005). Specifically, when coding my data, I separated gestures into signs, pantomime, emblems, speech-linked gestures, and gesticulations (see Chapters 2 and 3). Those established to be gesticulations were then further categorized as metaphoric, iconic, deictic, and/or beat. As previously discussed, current gesture taxonomies are created primarily from studying mid-air gestures that were typically observed in laboratory settings or while observing a speaker narrating a previously viewed cartoon story. With my focus on touch gestures, I had to consider the possibility that not all gestures I observed could be accounted for through the existing taxonomies.

In what follows, I first provide an overview of the distribution of observed gesture types. I then discuss in more detail the types of gesture current gesture taxonomies

identify and detail if and when I observed these gestures during a touch situation. Next, I move on to gestures that represent a variation on a currently recognized gesture type, and as such, can partially account for this type. Finally, I discuss types of gestures that currently cannot be accounted for in gesture taxonomies.

Given the focus of my study, when referring to gestures, and if not otherwise indicated, I am referring to touch gestures, here specifically the four formerly identified forms: Touching an object without changing its form or function, touching an object while changing its form or function, touching ones own body, and touching somebody else's body.

5.2.1 Distribution of gesture types.

In my study, I identified a total of 907 touch gestures after observing the 275 transcribed situations that formed part of my study. As shown in Figure 5.5, gesticulations were by far the most frequently observed type of gesture with a total of 856 instances (approximately 94% of all gestures), followed by modeling with 44 observed sequences (approximately 4% of all gestures), and all other gesture types sharing approximately 1% of occurrences (0 signs, 0 speech-linked gestures, one emblem, five pantomimes).

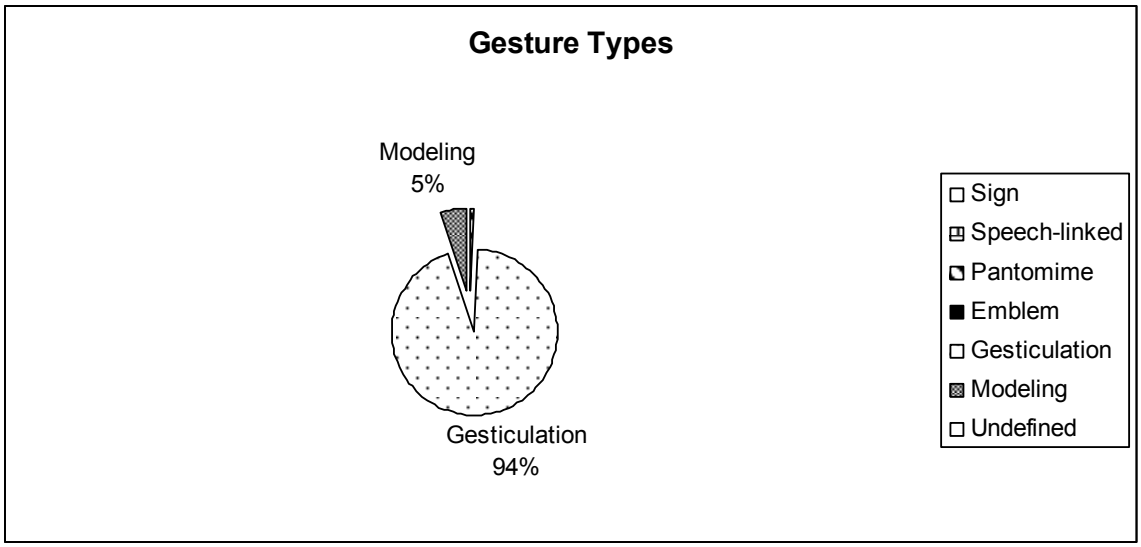


Figure 5.5. Distribution of observed gesture types.

I now discuss the gestures identified in the taxonomies and as I observed them. To that end, I describe their form and function and provide specific examples.

5.2.2 Signs.

McNeill (2005) defines "signs" as follows: "'[S]igns' are lexical words in a sign language," as for example, American Sign Language (ASL). "Sign languages have their own linguistic structures, including grammatical patterns, stores of words, morphological patterns, etc." (p. 5). Signs have also been described in terms of their use by hearing- and speaking-able people in environments where speech could not be possible because of noise levels; this happens, for example in a noisy work environment. Signs have also been described in situations where speech was not desirable as, for example, during hunting (Napier, 1993). Perhaps not surprisingly, I did not observe any incidents of

signs/sign language. All participants of my study were fully hearing individuals, and no situation arose in which an environmental condition (such as noise or distance beyond hearing distance) required a use of signs.

5.2.3 Speech-linked gestures.

"'Speech-linked gestures' are parts of sentences themselves. Such gestures occupy a grammatical slot in a sentence […]" as in "Sylvester went [gesture of an object flying out laterally]" (McNeill, 2005, p. 5). Thus combined, gesture and speech complete the sentence. I did not observe any occurrences of speech-linked gestures, although their absence is less easy to explain than that of signs.

5.2.4 Pantomime.

"'Pantomime' [refers to] a gesture or sequence of gestures conveying a narrative line, with a story to tell, produced without speech" (McNeill, 2005, p. 5). As stated previously, the current taxonomies on which I base my analysis are created primarily from situations where participants narrated a (cartoon) story. In contrast, the interactions I observed happened in an interactive, unscripted classroom environment because on two occasions participants gestured without the occurrence of speech. I believe that some of the gestures I observed can be called pantomime. These gestures are clearly not signs, a type of gesture that also appears without speech; they follow no internal grammar, syntax, or vocabulary as is typical for signs.

I captured pantomime during two scenarios. One occurred when students used pantomime to copy the instructor's movements without being prompted to do so (see

Figure 5.6). In a second case, the instructor pantomimed along with a student's speech and gesture (Figure 5.7). I discuss the second example further in Chapter 8.

Figure 5.6. Spontaneous student pantomime. (071009T2S8)

Speaker	Speech	Motion
Instr.	It's harder	 766
	with these muscles.	 784
	This is more ergonomically correct,	 826
	because it's pushing	 907

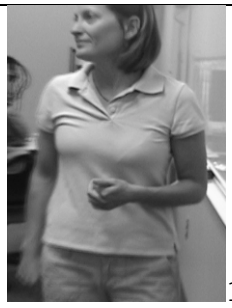
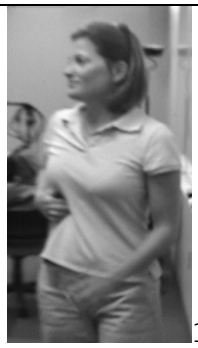
	and not ↑pulling	 950
Monica	It does! How often can you say,	 12869
	Oh, I just gonna play around right here.	 12893

Figure 5.7. Instructor pantomiming with student's speech and gesture. (071009T3S12b)

In Figure 5.6, the instructor responds to two students discussing techniques that can be used with a patient in a side-lying position, a position often found during prenatal massage. One of the students complains that her arms are too short to do a full stretch with her arms crossed. Another student then suggests that she could do the stretching technique by opening her arms instead of crossing them to widen her range. At their suggestion, the instructor explains that opening the arms for this technique is possible but

less desirable because of the stress it puts on the therapists arms: “It’s harder with these muscles. This is more ergonomically correct, because it’s pushing and not pulling.” Behind the instructor, a third student can be observed who follows along with the instructor’s actions using pantomime.

My current study does not allow me to test if and what knowledge students gain by performing pantomime or what role the instructor’s pantomiming along with students’ speech plays. A future experimental study could follow up on the observation.

5.2.5 Emblems.

“‘Emblems’ are conventionalized signs […]” (McNeill, 2005, p. 5), as for example, the “OK” sign, formed by the ring through touching fingertips of thumb and index finger. I observed only one emblem; with the instructor forming the “OK” sign with index finger and thumb (see Figure 5.8).

Instr.	“okay! [Gotcha][22].”	 744

Figure 5.8. Instructor forming “OK” sign, a gestural emblem. (061209T3S7)

[22] Brackets indicate that the motion displayed in the still opposite the speech is performed during the time within the brackets. Surrounding speech is used to prepare the gesture, return hands into the resting position or retreat from a tap/clap, etc.

5.2.6 Gesticulation.

"'Gesticulation' is motion that embodies a meaning relatable to the accompanying speech. […]" (McNeill, 2005, p. 5). Gesticulation is the most frequently observed gesture type in daily use. For the most part, it includes hand and arm movements but also the head and other body parts (McNeill, 2005).

Reflecting current research focusing on mid-air gestures, gesticulations were the most widely and commonly used touch gestures by my participants; 856 (approx. 94%) of all observed touch gestures were gesticulations. Interestingly, when gestures included touch, they often blurred the boundaries between the different types of gesticulation. For example, while I observed numerous instances of clearly deictic gestures, about 6% of all gesticulations were deictic gestures that also contained an iconic element.

As shown in Figure 5.9, I observed 138 instances of iconic gestures (approx. 16% of all gesticulations), eight metaphoric gestures (approx. 1%), 428 instances of deictic gestures (approx. 50%), 48 deictic-iconic gestures (approx. 6%), 149 tapping gestures, including counting and single tap gestures (approx. 17%), and 84 instances (approx. 10%) of tapping gestures combined with other forms of gestures, the latter included three tapping-metaphoric, 77 tapping-deictic, four tapping-iconic, and one deictic-iconic-tapping gesture combination. Finally, one gesture remains undefined, as it could either be a deictic or metaphoric gesture, depending on the instructor's thought process accompanying the utterance, efforts into which I have no insight.

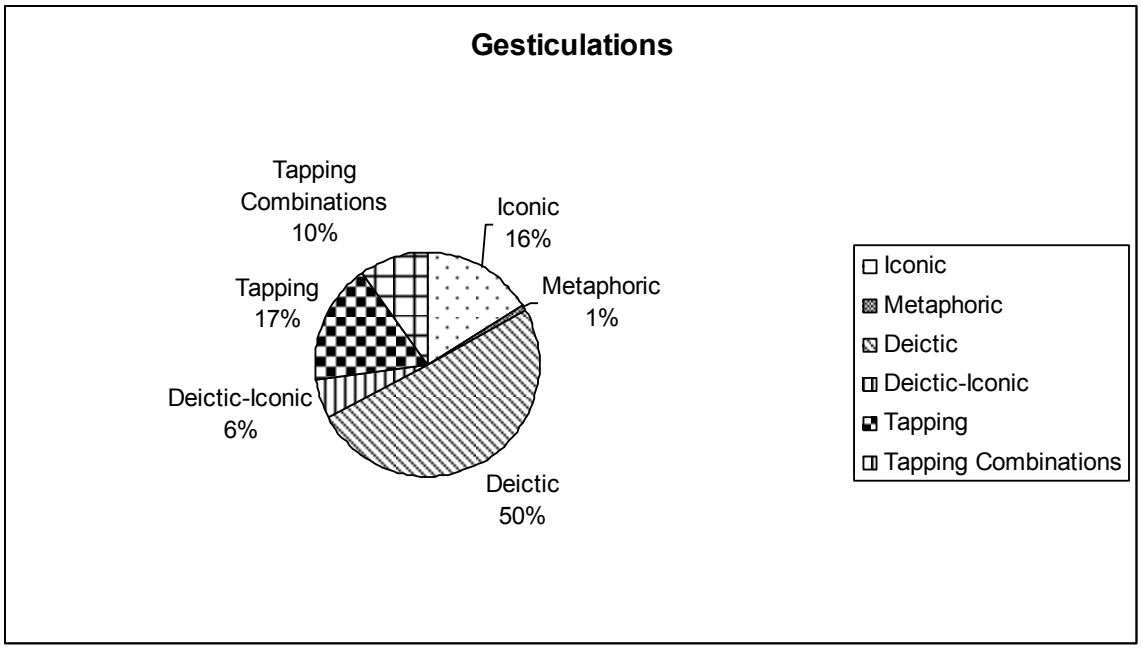


Figure 5.9. Distribution of types of gestures within gesticulation.

Having discussed the main types of gestures identified in the taxonomies as I observed them, I describe in what follows their subtypes of gesticulations, their form and function and provide examples of each.

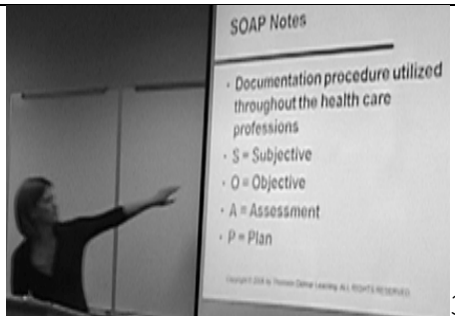
5.2.6.1 Deictic.

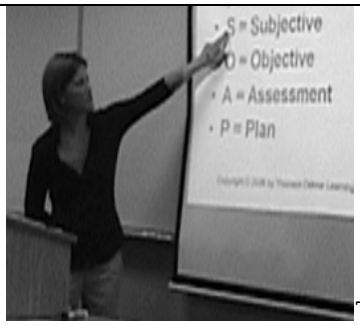
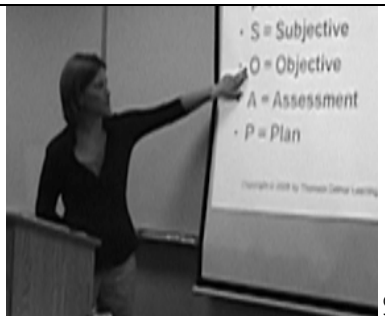
Deictic gestures are also often termed "pointing gestures" because they commonly appear when a speaker is pointing at something. Most often, deictic gestures are executed through an extended index finger (McNeill, 1992).

Within the classroom setting, the instructor often pointed at the projection of a PowerPoint slide or specific items on that slide (see Figure 5.10). Similarly, when she discussed a muscle or bone, she pointed out its position in the body on either her own or a

student's body. So, too, did students point at the position of bones and muscles in the body when talking amongst each other or when interacting with the instructor. Furthermore, instructor and students pointed at the locations of existing or imagined pains, for example, when the instructor talked about a client who walks in with a back pain and takes on the client's role or described his/her communication. Interestingly, pain-related pointing usually occurred on one's own body and not on someone else's. For instance, when students reported to the instructor that another student has a specific pain, they usually pointed at their own body instead of the other student's body (see Figure 5.11).

Figure 5.10. Instructor pointing at PowerPoint slides by means of a deictic gesture. (061209T3S10)

Time	Speaker	Speech	Motion
0:07:50	Instr.	What's	 31

		subjective,	 70 ((hand next to "S = Subjective"))
		objective,	 92 ((hand next to "O = Objective"))
		assessment,	 117 ((hand next to "A = Assessment"))
		plan?	 126

			((hand next to "P = Plan"))
			 154
0:07:53			

Lori	Uh mostly in [my shoulders] and my neck.	 102

Figure 5.11. Student using a deictic gesture to point out a shoulder pain. (061209T3S10)

Deictic gestures comprised approximately 50% of all occurrences of gesticulations, the most frequently observed type of gesture in my study. However, they do not deserve further discussion because the deictic touch gestures, which I observed, fulfill the same function as deictic mid-air gestures and have been discussed at great length by Kendon (2005) and McNeill (1992, 2005). In addition, Knoblauch (2008) provided interesting and detailed insights into the use and role of deictic gestures and the presentation of knowledge with the use of PowerPoint presentations.

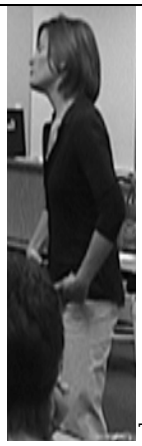
Often, deictic gestures co-occurred with beat gestures. My in-depth discussion of beat gestures appears later in this chapter.

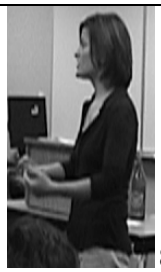
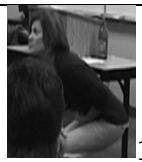
5.2.6.2 Deictic-iconic.

I repeatedly observed a type of gesture, which I call deictic-iconic gestures; they are a combination of deictic and iconic gestures. I am unaware of any discussion of such gestures in the literature. I have observed gestures with deictic as well as iconic qualities in situations when the instructor was discussing particular muscles, their location as well as their form and function. In these uses, the instructor not only pointed out where the muscle is located in the body but also often used one or both hands to illustrate the actual form and size of the muscle. As a result, the gesture acquired a visual quality comparable to an illustration of a muscle in a textbook, albeit not as detailed and precise because the mode of gesture is different than a printed image. But in fact, students might be able to better grasp where the muscle is located in the human body through the implementation of the gesture because it is demonstrated on an actual human body.

Figure 5.12. Instructor performing a deictic-iconic gesture to illustrate the form, function, and position of the psoas muscle. (061209T1S24)

Instr.	Their back feels better if they lay on the floor and put their feet up in the ↑chair (.) I would be horribly remiss if I did not check	 292

	their [psoas muscle on the inside of the hips. (.) Because the psoas muscle, (.)]	 786
	running from the [femur bones]	 819
	up to the	 843 ((upward motion))
	[pelvis],	 866

	connects on the	 894
	front of the lumbar vertebrae.	 917
	It's our [sitting] ↑muscle	 1055
	It's our [fetal position] muscle.	 1109
	It's our folding muscle.	 1202

As illustrated in Figure 5.12, the instructor not only pointed out the position of the psoas muscle in the body, but also elaborated on its form and function, indicating that the psoas muscle "connects on the front of the lumbar vertebrae" and functions as "sitting,"

"fetal position," and "folding muscle." Thereby, the function of the gesture is extended beyond the level of pointing into the iconic. I return to the occurrence, form, and function of deictic-iconic gestures in Chapter 7.

5.2.6.3 Metaphoric and iconic.

Metaphoric and iconic gestures are quite similar because they have a pictorial quality. While iconic gestures portray actual objects or actions, such as the size or form of a box, running, etc., metaphorical gestures portray abstracts, such as genre, system, etc. (McNeill, 1992).

Surprisingly, it seems to me, I observed only eight metaphorical gestures. I cannot yet explain the reason but it might involve the nature of massage and its instruction. Massage is a hands-on profession. In such cases, incorporating objects or people into a gesture is always accomplished through real action rather than through abstract thought.

Figure 5.13. Instructor uses a metaphorical gesture. (061209T1S13)

Instr.	As opposed to deliver it in a way that's gonna	 188

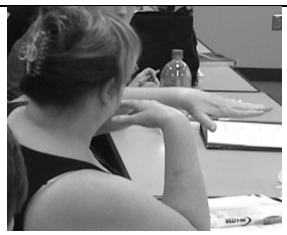
	[cut them off right- right away, and make them think they got the wrong number. (3.0)]	 263 ((forceful downward motion with RH))

In Figure 5.13, the instructor used a metaphorical gesture to symbolize the "cutting off" of a client on the phone. To cut someone off is a metaphor on the level of speech as well as on the gesture level since the person is not cut off literally.

Iconic gestures look and function in the same way as their mid-air counterparts; with 138 instances they are the second most observed type of gesture throughout my observations.

Figure 5.14. A student uses an iconic gesture to discuss the use of hydrocollator pads. (062609T4S5)

Speaker	Speech	Motion
Judy	I know, when I would have physical therapy, they would use those pads, and they would put it insi:de	---

	[a] [thing]	 283
	made for them	 321
	and then use three towels	 368
	between your skin	 449
	and it- it still makes a lot of heat.	 480

In Figure 5.14, a student discussed the use of hydrocollator pads. The speech is accompanied by iconic gestures, illustrating the use of the pads and towels. In frame 283, the iconic characteristics appear in relation with a short tapping sequence of two taps on "a" and "thing."

Gestures that exhibit metaphoric and iconic characteristics may also include characteristics of other gesture types. As already discussed, I observed deictic-iconic gestures. In addition, I observed one instance of a deictic-iconic-tapping gesture and three metaphoric-tapping gestures. Since the latter two combinations are rather rare, I am unable to draw any conclusions about them other than mentioning them here.

5.2.6.4 Beat versus tapping.

In the literature, beat gestures are described as gestures that work because of their appearance on the discourse level, signifying that different parts of speech are related. They look similar to beating musical time and hence their name (McNeill, 1992). I have encountered a large quantity of beat gestures, often, as indicated, in combination with iconic, deictic, metaphoric, or deictic-iconic gestures that fulfill the same discourse level qualities as mid-air beat gestures. However, since touch is involved, beat gestures appear more as tapping than actual beat. Hence, I refer to beat gestures that involve touch as tapping gestures. Often tapping coincides with audible thuds or clicking sounds created by the actual tapping of fingers, hands or objects against a surface; sometimes tapping is created by finger snapping.

In contrast to beat gestures, tapping can sometimes occur as one single and often clearly audible thud. While I am not unaware of discussions in the literature of single beat gestures, single tapping gestures are relatively common. I believe that the function of such a single tap also occurs on the discourse level, here to emphasize a specific syllable or word of the accompanying speech. I discuss this issue in depth in the following chapter.

Finally, I observed gestures which cannot be accounted for through current taxonomies. Specifically, these are two types of gestures: counting and modeling. While I describe their form, use, and function in depth in Chapters 6 and 7, here I provide a short overview of their appearance.

5.2.7. Counting.

I observed 79 instances of counting gestures. They were usually performed with both hands involved and one hand tapping or holding typically one, and sometimes, two, three, or four fingers, of the other hand. The action showed a deictic relation to the accompanying speech. That is, for example, when talking about ingredients of the "Master cleanse," a drink for fasting, the instructor mentioned the ingredients in speech and simultaneously touched another finger for each ingredient she mentions. As such, the gesture appeared as if she is counting.

Most commonly, the counting gesture involves little more than a short contact but sometimes can be extended into a hold. A hold is observed when the speech still covers the same subject to which the gestural action refers. This hold also may be extended over the turn of a second speaker who contributes to the discussion of the topic.

5.2.8 Modeling.

I observed 44 modeling gestures. While they appear to be very similar to practical actions, I argue that these movements are gestures and not practical actions. To recapitulate, following Kendon's (2005) definition of a gesture, a movement is considered a gesture when it is performed (1) under voluntary control, (2) done for the

purpose of expression, (3) rather than in the service of a practical claim. He further points out that some movements may be at times regarded as gesture and at times not as gesture, depending on the context and circumstances of the movement. As discussed in Chapter 1, Kendon argues that to regard a non-gesture as a gesture, observers have to perceive an action as a "performance" that is "recognized as having an expressive aspect" (2005, p. 9), which goes beyond the movement's practical function.

In the situation of massage therapy instruction, when the instructor demonstrates particular techniques of massage, draping, or positioning a client with respect to the class, her actions are not intended to provide a massage to a client; they are performed in front of the students with the purpose of instruction. While the action is extremely similar to the actual instance of giving a massage, it is also different from it. First, the instructor accompanies the action of massaging, draping, etc. with speech, explaining the different aspects and elements of the technique demonstrated. Second, the demonstration may be paused at any moment to explore background information associated with the element being demonstrated. For example, the instructor may interrupt a demonstration to discuss what pillows to use, what pillows she uses, and where to buy them. Third, the demonstration is observed in front of the students and for the purpose of such observation. All these elements provide sufficient support to my argument that the demonstration is not a practical action but rather a performance that is "recognized as having an expressive aspect." Therefore, it must be considered a gesture.

5.3 Conclusion

This chapter introduced gestures I observed and demonstrated how they stand in relationship to currently identified types of gestures (Kendon, 2005; McNeill, 1992, 2005). Within the corpus, I was unable to identify any signs or speech-linked gestures. However, that does not necessarily mean that they do not exist in touch gestures. The types I observed included pantomime, emblems, and gesticulations. Finally, I also observed gestures that do not seem to fit in any of the existing gesture taxonomy categories. I labeled these gestures counting and modeling.

I believe that accounting for pantomime and emblems is unproblematic. From my observation and analysis, these touch gestures are similar to mid-air gestures and, besides the added feature of touch, do not differ in their form, function, or use. The same observation holds true for iconic, metaphoric, and deictic gesticulations. Therefore, I will not discuss these gesture types individually. I will, however, address them again in the eighth chapter when discussing the interwoven nature of different gestures more broadly and in combination with other modes and modalities.

Beat gestures, the fourth and final subgroup of gesticulations identified by Kendon (2005) and McNeill (1992, 2005), differ in form and possibly function from their touch counterpart, tapping. Therefore, I discuss them in depth in the following chapter. I also link the discussion with one of my newly identified gesture types, counting, which appears to form a subgroup to tapping gestures.

The analysis of gesticulations held a further unexpected result. Different gesticulation subtypes appeared in combination with each other; for instance, I observed

tapping-metaphoric and deictic-iconic gestures. Deictic-iconic gestures are the only subgroup of those that I observed in a larger quantity, and therefore deserve further analysis in this study in Chapter 7. Albeit interesting, I have insufficient data to further discuss the other observed gesticulation subgroup combinations.

Finally, I observed a second new gesture that I call modeling. Modeling does not constitute a subgroup of any of the gestures acknowledged in current taxonomies. As such, I analyze the gesture's form and function in Chapter 7 as well as discuss its place on Kendon's Continuum (McNeill, 2005). Having discussed my findings, the next chapter discusses tapping and counting gestures.

CHAPTER 6

Discussion: Tapping and Counting Gestures

At present, I have introduced my data and the different types of gestures I observed and categorized. On that basis, I now offer an in-depth discussion of the form and function of two types of gestures, namely, tapping and counting. I focus on these two because, as I observed them, they have not been accounted for in existing gesture taxonomies. As I show, they need to be identified and distinguished, and I do so here. I begin with tapping gestures because they are closely related to current gesture taxonomies; I then discuss counting gestures as a subgroup of tapping gestures.

6.1 Tapping

As discussed in Chapter 5, tapping gestures closely resemble beat gestures. However, since touch is involved in the execution of the former, they are realized as tapping and often produce audible taps, thuds, clicks, etc. Sometimes, people use their fingers to snap once or multiple times in a rhythmic manner, producing yet another variation of beat or tapping gestures. Taps are often very precisely timed to coincide with single words or syllables the speaker produces. Because of these characteristics and because of their different appearance from mid-air beats, I refer to these gestures as tapping gestures.

McNeill (1992) argues that

> Beats reveal the speaker's conception of the narrative discourse as a whole. The semiotic value of a beat lies in the fact that it indexes the word or phrase it accompanies as being significant, not for its own semantic content, but for its discourse pragmatic content. […] Thus beats mark information that does not advance the plot line but provides the structure within which the plot line unfolds. (p. 15)

Based on my observations, I believe that tapping fulfills the same function. As such, tapping gestures are used to reveal a speaker's conception of the relation of different parts of the speech. For example, they often connect different items as belonging to one topic, they introduce new themes, or they summarize a topic before either exploring it more in depth or moving on to a new one.

Similar to beat gestures, tapping does not advance the plot line, so to speak, but it does provide insight into what a speaker considers important. In this, beat gesture is like intonation in speech; for example, while intonation emphasizes a word by speaking louder, faster, etc. or techniques such as underlining or italicizing in writing, tapping "underlines" information that the speaker deems important or noteworthy. In so doing, the delivery of a speech-gesture utterance contains and unites rhetorical concepts, such as style and arrangement. Since style includes tone, rhythm and their emphasis in its tool-kit, as arrangement offers temporal emphasis to the situation (Newman, 2009).

Figure 6.1 provides an example of the instructor introducing a topic excursus (frame 267), before returning to the main topic and recapitulating it (frame 666), and then moving on to a new topic. The situation unfolds as the instructor explains to the students

the specifics of lymphedema massage, a specific form of massage that needs particular training. Lymphedema massage assists the body in moving toxins to the lymph nodes. It may be particularly beneficial to a client who has just undergone surgery; however, the massage therapist needs to consult with the attending physician about performing the massage.

Figure 6.1. The instructor uses tapping gestures to focus students' attention. (071009T2S17)

Speaker	Speech	Motion
Instr.	This is po:st-surgical (.) lymphedena massage.	 38
	Your doctor [needs][23] [] [to] [know] [about it.]	 267 ((tapping with pen on hand))
	Doesn't mean the doctor has to be there while you are doing it. The doctor has to know about it. They have to be confident in your knowledge about	 340

[23] Each tap is visualized through square brackets, for example: [needs]. If no speech coincides with the tap, the transcript uses brackets only, for example: [].

	spe[ci]fic (.)[lymph]edema massage.	 666 ((tapping with pen on book))

In Figure 6.1, the instructor's main topic is lymphedema massage, its form, function, and benefits for a client. The discussion leads her to address the example of a client who had his/her lymph nodes removed surgically. In turn, this leads the instructor to the introduction of a topic excursus. She says, "Your doctor needs to know about it," hereby urging her students to contact the client's attending physician to inquire if a lymphedema massage is recommended and will benefit the client. The introduction of the subtopic "doctor" departs from the instructor's main theme. Accordingly, the excursus is introduced through the use of tapping gestures. She then elaborates on the topic of "doctor" before returning to her main theme lymphedema massage. As she recapitulates "specific lymphedema massage," the discursive turn is marked through the use of tapping gestures. She furthermore emphasizes the words by stating them louder than the surrounding speech, which supports the discursive move. Again, gestural arrangement and style (rhythm and tone) of the utterance aid its delivery. Specifically, the use of tapping gestures marks the beginning and end of the excursus, thus arranging the "doctor" example the instructor provides as an excursus to the main theme of her instruction. In addition, the combination of tapping with a correlated emphasis in her

speech, uses distinctive elements of style that "underline" what she deems important and, therefore, what students should pay specific attention to.

The instructor repeatedly stresses that allopathic (Western medicine which focuses on medication, surgery, etc.) and alternative medicines (such as massage, acupuncture) cannot exist without each other and without acknowledging each other's importance in human health. She also warns students that their future privately run business will always be connected with other practitioners; therefore, they need to understand how to consult and co-operate with them. This belief becomes visible in her use of tapping not only to link elements of the utterance but also to emphasize her words beyond stress and intonation (see Figure 6.2). Figure 6.2, even more so than Figure 6.1, is an example of how tapping as a function of style supports the delivery of the topic at hand by emphasizing in speech and gesture what is deemed most important.

Figure 6.2. Complex example of the use of tapping gestures. (062609T2S15)

Speaker	Speech	Motion
Instr.	And that's important,	 0

	the [com]ing together	 12 ((swift, forceful tap))
	in cross-acceptance. Because you: will find people	 119
	in both schoo:ls	 176
	who: [2x] butt[heads]. [] [Like] [I] [was] [saying] [earlier], [one] [can][not] [exist] [with][out] [the] [oth][er]- [or] [with] [the] [oth][er] [in] [my] [mind. He said "no no no, no no no." (.)]	 254 ((tapping fists against each other))

	It's very important that we have	 724
	[cross]-[accep][tance] [for]	 859 ((tapping and interlinking fingers))
	[the] [value] [of] [each] [of] [these. (.)]	 914
	Do you have much (.) credibility in convincing people if you tell them that their approach is crap?	 1282

Figure 6.2 provides a more complex example of a succession of tapping gestures. In the episode, the instructor discusses allopathic as well as alternative medicine and the tensions that exist between the two schools of thought. While allopathic medicine is the predominant form of medicine in Western countries, alternative forms of medicine

compete for acceptance, visibility, patients and clients as customers, and therefore money. Thus, the two approaches often appear to be mutually exclusive, yet more and more practitioners strive toward cooperation and collaboration. For example, in the Planetree model, hospitals not only allow patients absolute access to their records but also include massage therapists and other alternative practitioners in the treatment; the model also provides an overall soothing hospital environment with lots of plants, waterfalls, kitchens (the smell of cooking as a reminder of home and family), etc. to improve patients' well-being and recovery.

However, as the instructor points out, not everyone on the allopathic and alternative sides believes in collaboration and the mutual benefits thereof. Nonetheless, she supports collaboration and mutual respect. This opinion is visualized in frame 12 where a forceful tap on "coming" emphasizes her message to the students that she considers the coming together of both schools of thought as extremely important. While she emphasizes "important" in her speech, the single tap which then follows emphasizes what she deems most significant, namely "the coming together in cross-acceptance." This conviction is then emphasized through an emphasis in speech on "cross acceptance" (frame 119).

Frame 254 provides an interesting example of an utterance where the speaker taps on almost every syllable. I believe that the tapping here serves two purposes. One, on the discourse level, the instructor communicates that she is here providing an example that diverges from her main topic. Furthermore, the tapping stresses the weight of the information she is relaying to the students, here the importance of cross-acceptance. This

message is enabled through the metaphoric gesture her hands have taken on; that is, both her hands form a fist and she is butting them against each other, thereby producing tapping. The tapping of the fists, metaphorically, visualizes the butting of the "buttheads." In a rhetorical sense, therefore, the gesture becomes a visual metaphor and thus relates the notion of style once more in delivery; in classical canons, metaphor is an element of style.

In frames 859 and 914, repeated rhythmic tapping on "cross-acceptance" and "the value of each of these" helps the instructor to reiterate her message of cross-acceptance. Again, I observed how the tapping gestures are very precisely timed to match the utterance of whole words (often very short, one or two syllable words), and syllables. The tapping brings the speech together in a way that the uttered words cannot alone accomplish because tapping supplies visualized rhythm. Furthermore, in this specific example, tapping supports the instructor on the discourse level, both by emphasizing her topic of cross-acceptance and underlining an example, which supports her main topic. Throughout, the instructor's use of gesture incorporates elements of style without which the delivery of her statement would have been much less forceful. The use of a metaphoric gesture allows her to visualize the "buttheads" she is referring to in her speech; by producing metaphoric tapping gestures on almost every word, gestures support her message's delivery. Thus, gestures emphasis and relate the information she is teaching to the class on more than the level of speech.

Similarly, in Figure 6.3, tapping relates the elements of the main topic. While in frame 61, the instructor produces one tap on "spell" and further emphasizes the word by

producing it louder than the surrounding speech; she later taps on "[…] muscle by its name. Not shoulder muscle" (frame 148). The speech in frame 148 elaborates on what students must be able to spell, namely the proper (Latin) name of muscles. Again, the tapping connects the main information of the topic throughout the utterance in a way words cannot, while the variation in emphasis and volume in the instructor's speech emphasizes what she considers the most important information in her teaching. Tapping, as an element of delivery, hereby directly influences how the argument is made.

Instr.	You wanna be able to	 41
	spe:ll.	 61 ((one tap in hand))
	You wanna be able to call a [muscle by its] [name. Not] [shoulder muscle].	 148

Figure 6.3. Use of a single tap. (062609T2S21)

The next example (see Figure 6.4) adds another element to the meaning of one tap, the audible sound of a thud. As mentioned earlier, depending on the situation, the thud may also sometimes be a click, clap, snap, etc. Here, the audio supports the visual element and draws attention to the content of the spoken word.

Instr.	[she gets all the hydrotherapy equipment over in the other room.]	 397 ((hits the podium with loud thud on "she"))

Figure 6.4. Use of single tap with audible thud. (062609T4S2)

The instructor's hand hits the podium with a loud thud on "she" and then stays in a hold position, that is, the position of the hand remains the same until the end of the sentence. I believe what can be observed here is yet another excursus from the main topic that is visualized and heard through the tap with extended hold. In this situation, the instructor begins by discussing hydrotherapy[24] with her students. However, as she suddenly realizes, she has no equipment in her room to show it to her students; another instructor ("she") has "all the hydrotherapy equipment over in the other room." She is visibly unhappy about this arrangement yet remains professional. Perhaps, the audible

[24] Hydrotherapy is a form of treatment that involves the use of water to relieve pain.

thud (instead of a quieter tap as she had produced them many times) is her way of venting some disagreement with the arrangement. The situation is later resolved by one student being sent to the other room and instructor to borrow some equipment for the class.

The single tap and multiple taps including sound elements are not accounted for in current discussions of beat gestures. I believe that the touch gesture opens up an expressive opportunity for the speaker that the mid-air gesture cannot provide. The inclusion of objects and/or sounds in the gesture incorporates another mode to the delivery of the topic to the class and its embodied knowledge. Beat and tapping gestures work on the discourse level, providing insight into the speakers' conception of the narrative structure. Tapping, with the added possibility of audible thuds, clicks, raps, and snaps emphasizes these changes in the narrative, similar to the way in which a louder or quieter voice often signals a change in the importance of an utterance. Finally, tapping (with or without audible elements) often co-occurs with a changed intonation, an element of style, in the coinciding speech. The pattern involving this change in speech emphasis emphasizes the importance of a message relayed. Together, gesture and speech, contribute to the representation of the message. One without the other would be less efficient in doing so.

As a variation of beat, I believe that tapping should be included in gesture taxonomies. Including single taps in the taxonomy, with or without aural elements, raises a number of methodological questions. First, to my knowledge, the literature (for example, Kendon, 2005; McNeill, 1992, 2005) does not discuss how beat gestures are counted. While it is acknowledged that the gesture phrase of a beat gesture consists of

two elements (stroke and retrieval) and not three (preparation, stroke, retrieval), researchers do not discuss how they should be counted. In other words, the following question arises: Should counting beat (and therefore tapping as well), strictly follow the definition of one stroke per gesture, or should uninterrupted beat and tapping gestures be counted according to the sequences in which they occur?

A gesture's core is the stroke, and per definition, every gesture always contains only one stroke. Every single beat or tap is one stroke and, therefore, should be considered a single gesture. However, all beats and taps performed within one sequence function as a unit. When discussing the use and role of gestures in human communication, I believe that the number of sequences (which contain at least one tap/beat) allow for a better comparison with the occurrence of other gestures. To acknowledge the definition of gestures by strokes as well as their meaning potential, a researcher might count single taps and beats as well as the number of sequences. Instead, for my study, I decided to count tapping gestures according to uninterrupted sequences rather than strokes. The reason lies in the nature of my study, namely, my interest in the use and role of gesture in the transmission of embodied knowledge. In other words, I am less interested in pure numbers and more in the role gesture plays in the process of meaning-making. As I have shown, tapping gestures contribute to the delivery of information, and, therefore, to the representation of knowledge, adding elements of style, arrangement, and additional modes that cannot be found in speech alone. The combination of speech and gesture allows the instructor to deliver her lessons to the class in the most effective way.

6.2 Counting

Another gesture that I encountered in my observations, 79 times[25] to be exact, had not appeared in the literature, and is, what I call, the counting gesture. The name originates from its appearance; that is, it looks as if someone is counting something up on his/her fingers. In most cases, people only touch one finger at a time, for example, their index finger, then their middle finger, then their ring finger. However, at times they may touch two, three or even four fingers at once. While the thumb is part of the single touches, I have not encountered any instances where multi-touches (instances in which the speaker touches more than one finger simultaneously) included the thumb. This might be a matter of practicality since the thumb is attached lower on the hand than the other four fingers.

Counting may occur as a single touch to either one or multiple fingers. It may also occur in a succession of single fingers, multiple fingers, or a combination of both. For example, a speaker may touch his/her index finger, then middle finger, then ring finger. Or a speaker may touch his/her index finger, middle finger, and then index and middle finger at once. At times, the speaker may go beyond the count of five and revert to touching a finger used earlier. The touch time of one or multiple fingers can be extended into a hold. Counting may also appear as a succession of rhythmic taps on one finger before moving on to the next.

Counting gestures appear to be yet another sub category of tapping gestures. First, the actual counting is a tapping gesture. Second, and more importantly, counting works

[25] Similar to tapping gestures, I am counting uninterrupted sequences and not gesture strokes.

on the discourse level, quite similar to beat and tapping gestures. They too reveal the speaker's perception of the narrative structure. Counting gestures reveal deictic references to the co-occurring speech. Sometimes these references are quite explicit, for example, when the speaker uses a counting reference in his/her speech. An example of such an instance can be found in Figure 6.5, "So now your homework for next week in *part one* is to go home […]" (emphasis mine).

Figure 6.5. Use of counting in gesture and speech. (061209T1S14)

Instr.	So now your homework for next week,	 74
	in part one, is to go	 106 ((index finger))

	home	 121 ((no contact between hands))

The counting gesture occurs when the instructor touches the index finger of her left hand with the index finger of her right hand. She simultaneously says, "in part one, is to go." The hands are then released from touching each other. However, the left hand remains in the counting position, and the touch then is continued when the instructor brings her right hand index finger back to her left hand index finger and explains what she expects the students to do, namely to "stand in [front of the] mirror and practice saying hello" (see Figure 6.6).

Figure 6.6. Continuation of a counting gesture after temporary release. (061209T1S14)

Instr.	and stand	 139

	in mirror and practice saying "hello."	 179
SS	((laugh))	179

The counting of the index finger supports the speech; both signify "part one." The gesture hold then visualizes the speech that follows the announcement of "in part one," explaining what this "part one" entails, namely "go home and stand in mirror [*sic*] and practice saying 'hello.'"

The students understand that the instructor is only joking and respond by laughing. The instructor remains in the hold counting position with her index finger extended until the laughter has died down, and she continues with her instruction. Interestingly, when speakers refer to numerous points they wish to discuss in their speech, the counting, in their spoken utterance, often remains incomplete, that is, they only refer to the first point they wish to make.

It is more common for the speaker to refer to points s/he wishes to make in his/her speech in synchrony with the occurrence of a counting gesture (as in the example above, Figure 6.6); nonetheless, the explicit spoken utterance may also follow the gestural counting (see Figure 6.7).

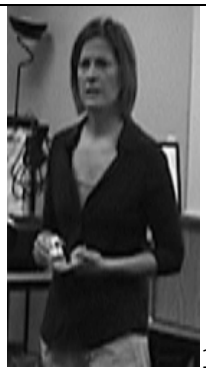
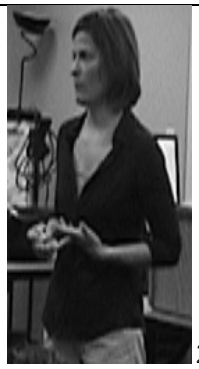
Instr.	"Would your say, your [pain is like really really] [high or is it]	 137 ((counting motion on index finger))
	[low]?"	 243 ((counting motion on middle finger))
	Well, you've just gave them two- They have only two answers, they can give you.	 343 ((holds up 2 fingers up (index & middle)))

Figure 6.7. Counting in speech following counting in gesture. (061209T2S14)

In Figure 6.7, the instructor discusses how massage therapists can learn more about a client's pain level. Therapists may only ask if the level is high or low, or, as the

instructor later explains, use a detailed scale that allows for a more precise exploration of the pain level. The count is only implicit in the speech when the instructor offers the two possibilities from which a patient may choose, here high and low. However, these two choices are visualized through consecutive counting gestures as she holds her left hand index and middle fingers respectively. Finally, in frame 343, she explicitly states that a client now has "only two answers they can give you." She simultaneously holds up her index and middle finger in (mid-air) counting gesture to reference the number two.

More often, the counting remains implicit in the speech, when, for example, the instructor lists related points which are part of the topic, but appear explicitly only in the gesture (see Figure 6.8).

Figure 6.8. Counting gesture without additional counting reference in speech. (061209T2S27)

Instr.	It could be one where you are wanting to know,	 29

	any [surgeries]	 106 ((middle finger))
	they may have had that may be pertinent.	 157
	(.) [Medications they are ↑taking]	 289 ((ring finger))
	[Are they under the care of a ↑physician If so, for] [what]? [(.)]	 372 ((little finger))

	Does the physician know they are receiving massage?	 725 ((index finger))

In Figure 6.8, the instructor lists issues that should interest a massage therapist before s/he begins treating a client. The instructor lists but never explicitly counts the following issues in her speech, (1) "[…] any surgeries […] that may be pertinent" (frames 106, 157); (2) "Medications they are taking" (frame 289); (3) "Are they under the care of a physician? If so, for what?" (frame 372); (4) "Does the physician know they are receiving massage?" (frame 725). Although she never explicitly states that these are different points, the counting gestures clearly do. The speech utterances are accompanied by the following fingers: "[A]ny surgeries"—middle finger; "Medications they are taking"—ring finger; "Are they under the care of a physician? If so, for what?"—little finger; "Does the physician know they are receiving massage?"—index finger. Here, the counting gestures take on the role of linking the listed items on the discourse level as belonging to each other.

Counting gestures usually follow the succession of fingers on the hand, for example, index, middle, ring finger, instead of a random assignment, for example, ring finger, middle, index finger. However, Figure 6.8 also demonstrates that the order of fingers used is not always strictly followed. Here, for unknown reasons, the instructor

begins by tapping her middle finger, follows the succession of fingers on her hand but then runs out of fingers. So she begins over again with the index finger.

Counting gestures share elements with the use of bullet points or numbering in writing, which a writer uses to order and emphasize points. However, counting gestures are not always as organized as one can expect of bullets in writing. One of the reasons for gesture slip-ups may be found in the spontaneous nature of gesticulations. They are not planned and revised as writing often is. That is, although a speaker may repeat what s/he just said and produce a different gesture with the new utterance, whatever s/he said and gestured before cannot be made unheard or unseen. In other words, although a gesture can be revised in a sense, the revision is very different from a revision in writing where readers are typically presented with the final draft alone. In addition, human hands are limited to five fingers, which may or may not be sufficient to reference all the points a speaker wishes to make. Therefore, the speaker may have to revert to re-using fingers. Because counting is a subtype of tapping gestures, its functions use elements of style (stress and intonation), arrangement (temporal ordering), and modes (sound, visual, movement) as tapping gestures do. Here, another rhetorical element is added, namely memory. It appears that the counting of the fingers may support the speakers and the audience's memory of what was and is being said. The following example (see Figure 6.9) illustrates this point further.

Sometimes the counting gesture is used as a tool to refer back to something said earlier. In Figure 6.9, the instructor discusses the Master Cleanse, a juice that supports fasting by means of its cleansing qualities for the body. She begins by listing the

ingredients of the juice, which is accompanied through counting gestures. Similar to the last example (Figure 6.8), the count is only implicit in the speech but explicit in the gesture.

Figure 6.9. Counting gesture to list items. (062609T1S9)

Instr.	It is (.) [lemon juice],	 1344 ((index))
	[water], (.)	 1411 ((middle))
	[maple syrup],	 1527 ((ring))

	organic, and [cayenne (1.0)].	 1630 ((little))

What is interesting in this example is that after listing the ingredients, the instructor continues to discuss a few of them more in depth (see Figure 6.10). Hereby, she not only refers back to the ingredients in speech by naming them again but also in gesture by reusing the fingers she had used before when listing that specific ingredient. However, her reference is not always precise. She correctly reuses her index finger when referring to lemon juice (Figure 6.9, frame 1344; Figure 6.10, frame 1761), but uses the middle finger instead of the ring finger when referring to maple syrup (Figure 6.9, frame 1527; Figure 6.10, frame 2200).

Figure 6.10. Counting gesture with discrepancy in order. (062609T1S9)

Instr.	So:, the lemon [juice]	 1761 ((index))

	draws toxins out of the body, (.) the water obviously helps to flush and balance it out so you're not getting intense, concentrated lemon juice.	 1811
	The [maple syrup], [besides] [from just] [sweetening it up a little bit], [serves as a little bit of an energy boost, to you,]	 2200 ((middle))

The discrepancy may arise out of the spontaneous nature of gestures; again, gestures cannot be revised in the way writing can, or the fact that the index finger is located next to the middle finger. Accordingly, she simply follows the order of the fingers on her hand. As discussed before, these gestures seem to fulfill similar ordering functions as bullet points or numbering in writing but are produced on the spot without rehearsal or a further possibility to correct them. Another similarity to writing appears in the arrangement of the discussion. While Figure 6.9 functions like an introduction in a written argument, Figures 6.10 and 6.11 then appear as amplifications (or body paragraphs) of the formerly introduced items. As such, the counting gestures link the two "body paragraphs" to the "introduction."

The counting gesture, because of its function on the discourse level, supports the delivery of the information by visualizing the order, that is, the arrangement, of the different components or parts (here, the ingredients of the Master Cleanse), which together constitute the whole (here, the Master Cleanse juice). The gesture visualizes the idea that the main topic (here, the Master Cleanse) is comprised of a number of subtopics (here, the ingredients).

After a first emphatic repetition of gestures (see Figure 6.10), the instructor repeats them a second time, now pairing lemon juice with the index finger and maple syrup with the middle finger; this follows her first repetition of the items (see Figures 6.10, 6.11). The precise correlation of the two repetitions may be due to the short time between the first and second part of the speech as well as to the more limited number of ingredients and gestures. It appears that the counting gesture functions as a memory aid, thereby supporting the delivery of the information.

Figure 6.11. Counting gesture with precise order. (062609T1S9)

Instr.	So you get [organic] lemons,	 2677 ((index))

	you [get or]ganic maple syrup.	 2720 ((middle))

Later on in the same discussion (see Figure 6.12), the instructor incorporates another interesting aspect when using the counting gesture. The gesturing represents a part to whole relationship articulated in the speech.

Figure 6.12. Counting gesture demonstrating part to whole relationship. (062609T1S9)

Instr.	Some people do [juice diets]	 3857 ((index))

	where they are getting natural [fruits]	 3938 ((index))
	and [vegetables],	 3966 ((middle))

At first, the instructor mentions “juice diets” while counting with her index finger (frame 3857). She then proceeds by listing the ingredients of a juice diet, fruits and vegetables, by tapping her index and middle finger respectively (frames 3938, 3966). In other words, after touching her index finger once, she immediately returns to it for a second touch and then moves on to touch her middle finger. This succession suggests that the juice diet represents a whole with fruits and vegetables as its parts. Her counting sequences then represent these whole and parts. Put another way, while the first index finger count associated with the juice diet constitutes one counting sequence, the second index finger count and the middle finger count, associated with fruit and vegetables

respectively, constitutes a second counting sequence. As a result, they offer visual representations of the concepts and words with which they are associated.

A similar succession of gestures in relation to items listed in speech can be found in the following example (see Figure 6.13).

Figure 6.13. Counting gesture demonstrating part to whole relationship. (062609T1S10)

Instr.	Some	 0
	[people],	 25 ((index))
	especially in the (.) [Indian] culture::,	 135 ((index))

	so- in- in kind of a more pure-ish yoga ↓culture eat [something called khichdi], which is a basmati rice based dish. It's basically just got [rice] and a little [veg]etables in it].	 360 ((middle))

In frames 25 and 135, a similar part-whole relationship as in Figure 6.12 is observable. Here, the first index finger counting gesture occurs synchronized with the utterance of "people." Subsequently, the same finger is used as a reference when the instructor discusses that it is "especially [used by people] from the Indian culture, with the tap occurring on "Indian." The gesture supports the spoken information that not all people, but specifically Indians, prepare and eat khichdi. Again, a part to whole relationship can be observed.

A variation of part to whole relationships appears in frame 360 of Figure 6.13. The instructor moves from tapping her index finger to tapping her middle finger in the usual sequence; that is, she follows to the next finger when moving on to the next point that is made in speech. Here, the instructor uses a repeated tapping gesture on "something called khichdi," "rice," and "veg[tables]". She does not switch between different fingers but recognizes the three items as belonging to the same category by repeatedly tapping on the same finger. Much like the examples mentioned before, a part to whole relationship can be observed, with khichdi being the whole as the dish that is prepared, and rice and vegetables as parts, the ingredients of which this dish is made. With the added complexity

of a part-whole relationship, in comparison of a simple listing of items, the counting gesture seems to support the speech as a function of memory more than ever. A future study should determine if that is indeed the case, and if the counting gesture supports the speaker's memory and/or the audience's memory of what is being said.

As already discussed, counting gestures and bullet points or numbers in writing seem to fulfill similar functions of ordering the discourse. I believe, this similarity goes even further than mere function but also can be observed in form and content. For example, in writing, we often use bullet points of different stylistic shapes at different indented positions to visualize the relationship between content discussed in the text (for example, see pp. 76-77). So, too, do counting gestures appear in different forms, actualized in the various ways the instructor touched fingers and repeatedly touched certain fingers. Both variations on counting style suggest the kinds of multilevel arrangement and style choices bullet points alone on the page represent. As such, counting gestures and bullet points can both arrange information visually and offer that visual mode to complement the print linguistic.

Although the similarity in form and function of counting gestures and bullet points is quite striking, I cannot at present conclude if and how they might relate to each other. The relationship between beat/tapping, counting, and single beats/taps can be graphically illustrated as shown in Figure 6.14.

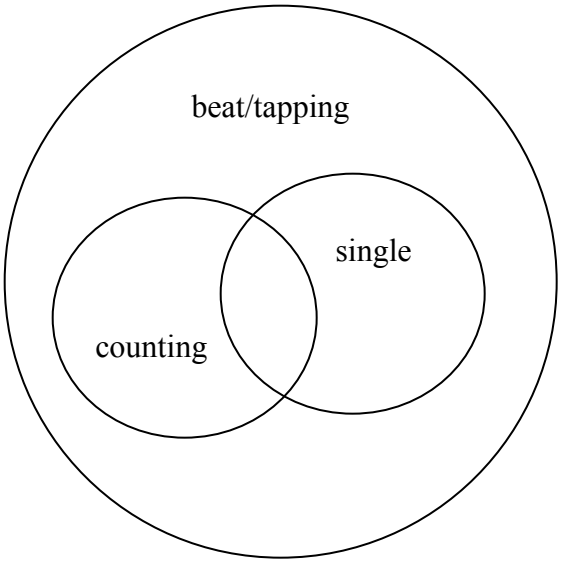


Figure 6.14. Relationship of tapping gestures, including counting and single tap/beat gestures.

Counting and single beats/taps are subgroups to beats/tapping. Single tapping take the form of taps, yet, as the name suggests, occur only once and not in rhythmic repetition. Counting gestures may occur in sequences or as single counts. Repeated tapping on one finger may occur before the speaker moves on to the next finger count.

However, it has become apparent that the relationship between tapping/counting gestures and speech is relevant in the process of meaning-making. While tapping and counting gestures do not contribute to the development of a plot line, they often hold crucial information about the discursive structure of the speech utterance. Furthermore, speech intonations in conjunction with tapping gestures often provide clues about how important a speaker deems certain information. Only the combined effort of speech and

gesture allows the speaker the full information encoded in the utterance. Therefore, I argue that speech and gestures are equally important in the process of meaning-making. To that end, gesture incorporates elements of arrangement, style, and memory to support delivery. As this kind of multimodal combination of rhetorical elements, tapping and counting gestures play an essential role in the representation of embodied knowledge. Without these gesture types, specific information about the discourse structure and about the importance of specific information would be lost.

Having discussed the relationship of tapping to beat gestures and of single taps and counting gestures as subgroup to tapping, I next discuss deictic-iconic gestures and modeling. In the following chapter, I begin by discussing deictic-iconic gestures, which are closely related to deictic and iconic gestures as identified in current taxonomies. Finally, I argue for including modeling as a new type of gesture in Kendon's Continuum.

CHAPTER 7

Discussion: Deictic-Iconic and Modeling Gestures

In Chapter 6, I demonstrated the form and function of the tapping gesture and its variations. But, they are not the only unaccounted for gestures I have found in my transcripts. I also have identified what I call deictic-iconic gestures and modeling gestures. In this chapter, I argue that deictic-iconic gestures are a combination of deictic and iconic gestures and therefore a subtype of gesticulation. Furthermore, I argue that modeling is a new type of gesture that does not fit into any currently acknowledged definition of gesture types.

7.1 Deictic-Iconic

Deictic-iconic gestures bear a close resemblance to two currently recognized gestures, namely deictic and iconic gestures. In this section, I demonstrate how deictic-iconic gestures are similar to yet different from deictic and iconic gestures. Current taxonomies convey a very clear-cut view of gestures. However, as mentioned previously, the taxonomies have been developed by observing gestures primarily within experimental settings with speakers narrating cartoons, with speakers who are not interacting with others, and on mid-air but not touch gestures (Goldin-Meadow, 2005; Kendon, 2005; McNeill, 1992, 2005). In contrast, my study draws its data from interactions within the complex realm of a classroom setting. As a result, I have observed gesture variations that

have not been observed in the regulated laboratory settings. These gestures are less structured and less well-defined as current gesture taxonomies suggest.

As discussed in Chapter 5, deictic-iconic gestures contain elements of deictic and iconic gesticulations. Deictic gestures, as described by McNeill (1992), take the form of pointing to indicate "objects and events in the concrete world, but [they] also [play] a part even where there is nothing objectively to point at" (p. 18). As a separate type, iconic gestures then are pictorial and "bear a close formal relationship to the semantic content of the speech" (p. 12). All of these characteristics are found in the gestures that I call deictic-iconic; therefore, I argue, they can be considered a true composite of the two. Because of their traits, namely, that the gesture "embodies a meaning relatable to the accompanying speech" (McNeill, 2005, p. 5), their spontaneous nature, the obligatory presence of speech, the absence of linguistic properties, and the absence of conventionalization (McNeill, 1992), they are a separate type of gesticulation, just as iconic, metaphoric, deictic, and beat gestures.

I observed deictic-iconic gestures, for example, when the instructor introduced specific muscles to the students. As illustrated in Figure 5.11 in Chapter 5, when discussing the psoas muscle, the instructor not only locates the muscle's position in the body through a deictic gesture but also elaborates on its form, size, and function—all typical characteristics of iconic gestures. The accompanying speech elaborates that the psoas muscle "connects on the front of the lumbar vertebrae" und functions as "sitting," "fetal position," and "folding muscle."

Not all deictic-iconic gestures follow the same model where the gestures are synchronized with the accompanying speech. The following example (see Figure 7.1) is a variation, where the gesture precedes the speech that comments on the gestural action.

Instr.	Okay, [so now put your hand under here]	 4909
	and begin to lift her shoulder up.	 4942

Figure 7.1. Gesture preceding speech in deictic-iconic gesture. (071009T3S26)

Here, the instructor explains to the student a technique of releasing a trigger point (a tight nodule in the muscle). Sometimes, putting pure pressure on the trigger point is not enough; releasing can be aided by shortening and thereby relaxing the muscle in which it lies. In this specific example, the instructor advises the student to lift the client's shoulder. In frame 4909, the instructor puts her hand underneath the clients' arm, barely lifting it. The gesture hereby has a deictic function that is supported in speech, "so now put your hand under here." However, the slight lift that occurs simultaneously is only

acknowledged in speech in the following frame 4943, after the instructor already has removed her hand and completed the gesture.

The gesture-speech mismatch may be due to the context in which the gesture appears. The instructor advises the student; this student then takes over, practicing on the student on the table. The speech in the second frame, "and begin to lift her shoulder," may be a commentary on her own gesture as well as on the student's action.

Singer and Goldin-Meadow's (2005) study of student learning under different gesture-speech conditions is not specifically related to deictic-iconic gestures but relevant to my discussion of gesture-speech mismatches. In that study, students were taught two strategies for solving a mathematical algorithm. In one setting, students learned through speech alone; a second setting provided instruction through speech with matching gestures; in a third setting, students were presented one strategy in speech and the other through gesture. In this third setting, speech and gesture formed a mismatch. Singer and Goldin-Meadow (2005) observed the unexpected result that "gesture per se did not promote learning—only gesture that conveyed mismatching information led to improved performance" (p. 88). While they cannot fully explain this finding, Singer and Goldin-Meadow (2005) believe that

> Algorithms presented in gesture provide children with a step-by-step procedure to follow but (unlike algorithms presented in speech) do not encourage children to rely exclusively on that procedure. Perhaps because gesture is not as explicit as speech, the information it conveys is less intrusive than information conveyed in speech. (p. 88)

In other words, while mismatched gesture and speech aided student learning, matched gesture and speech did not. This finding stands in contrast to other studies, which have found that gesturing aids student learning (for example, Goldin-Meadow, 2005; Valenzeno, Alibali, & Klatzky, 2003). Singer and Goldin-Meadow themselves point out that they cannot fully explain the discrepancy with these other studies. In a future study, it would be of interest to me to further explore the issue. I frequently observed gesture-speech matches as well as gesture-speech mismatches. However, given the nature of my study, I cannot draw conclusions if students' learning was successful in either of those situations.

A question that arises for me is if the situations in which learning occurred in the Singer and Goldin-Meadow study are comparable to the learning that takes place in a massage therapy instruction classroom. Mathematics, although for many a difficult and certainly a complex subject to master, often offers very specific formulas and algorithms with which to solve a specific problem. However, that is not necessarily the case in massage therapy. While work in mathematics is conceptual, work in massage is physical. Therefore, without further study, I cannot conclude how far Singer and Goldin-Meadow's findings are transferrable to the specific situation I observed. However, their surprising finding warrants further research in future studies.

My next example (see Figure 7.2) illustrates a second variation on the standard form of deictic-iconic gestures. As gesture research shows, when gesturing, most people use either only one hand or both hands in a synchronized manner (McNeill, 2005). The

use of both hands performing different gestures is rare. However, I found such events when observing deictic-iconic gestures as the following example demonstrates.

	Maybe you are in one trigger point on the //word// and you not only feel the- the	 2450
	re[lea]se [under] [your thumb],	 2651 ((pointing at thumb))
	but maybe you see the //word// jump. (.) But it's still the same muscle and it's over here. (.) But you may see something	 2723

Figure 7.2. Gesture preceding speech in deictic-iconic gesture. (071009T3S26)

During the same lesson on trigger points as mentioned in the example above, but earlier in the day, the instructor explains to the students how it feels when a trigger point releases, how the client's body may react to a trigger point release, and therefore, how they know that the treatment was successful. In frame 2450, the instructor makes an

iconic gesture with her left hand; she holds it in a position typical for treating a trigger point. In the following frame (frame 2651), the left hand remains in the same iconic position in a post-stroke hold, while her right hand performs an asymmetrical deictic gesture, pointing at and touching her own thumb. In addition, the deictic gesture is combined with a tapping element, when she taps her thumb on "lea" (in release), "under," and "your thumb." Here, both hands, also performing independent gestures, combining into a larger motion that could not be performed by eliminating one of the gestures. As such, the variation involves yet another asynchronicity. However, here the asynchronicity is not between speech and gesture but between the gestures of the left and right hands.

At this point, I must address my reoccurring observation of deictic and iconic gesture combinations on a more theoretical level. As indicated previously, gestures are considered non-combinatoric; in other words, two gestures cannot combine into a larger gesture. However, I have just repeatedly argued that a deictic gesture and an iconic gesture combine into a deictic-iconic gesture. Considering both hands independently, the deictic (or deictic-tapping) gesture and the iconic gesture remain independent gestures. However, in every single context I observed, only the combination of both gestures allows for the full representation of information. Independently, neither gesture is able to carry the same information. It is the arrangement of the hands, so to speak, that allows the speaker to make the argument s/he wishes to make. From a contextual point of view, the gestures' meaning combines into a deictic-iconic element. As those gestures are thus combined, delivery plays a crucial role in the knowledge representation.

As all models, gesture taxonomies provide a somewhat artificial breakdown of the elements of which they are composed. Although current taxonomies are extremely useful for the discussion of gesture and its use in human interaction, they are simplified and do not mirror the complexity of communication. After all, humans' use of gesture does not follow the categories of the taxonomies but the taxonomies try to define and group gestures according to observations of their form and function. Therefore, it is not surprising that gestures can be observed that do not fit into one category but overlap two or possibly more, as is the case with deictic-iconic gestures. The saying "the whole is more than the sum of it parts" is realized here. Deictic-iconic gestures provide the speaker and audience with more information than independent deictic and iconic gestures can. Therefore, in particular situations, speakers need to combine deictic and iconic elements in their movements to provide the gesture's full potential.

Deictic-iconic gestures, as well as tapping gestures, as discussed in Chapter 5, are all elements of gesticulation. According to researchers such as Kendon and McNeill, gesticulation is a subtype of gesture; gesticulation's subtypes are iconic, metaphoric, deictic, and beat gestures. As argued in this study, current understanding of the relationship between gestures and gesticulation needs to be extended. To that end, I suggest that gesture types comprising gesticulation are related to each other as shown in Figure 7.3.

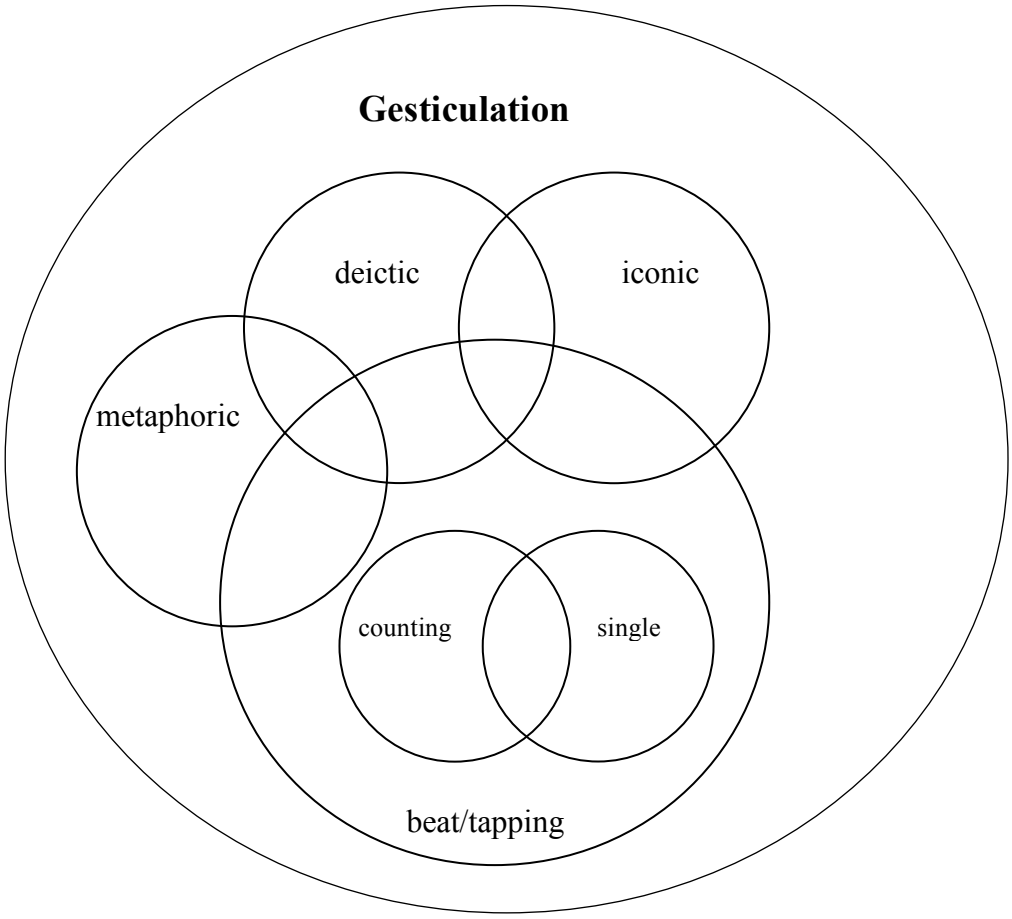


Figure 7.3. Relation of subtypes of gesture belonging to gesticulation.

This model of gesticulation not only accounts for the different subtypes but also their relationship to each other. It moves beyond the concept of iconic, deictic, metaphoric, and beat/tapping as separate entities and acknowledges the interrelatedness of the gestures. Specifically, it acknowledges the four main subtypes of gesticulation, that is, metaphoric, deictic, iconic, and tapping. Tapping/beat is displayed with its own subcategories, counting and single taps/beats.

As my research shows, tapping may occur in combination with deictic, iconic, and metaphoric gestures. As just discussed, I have also found deictic-iconic gestures. Although I have not found deictic-metaphoric gestures, and I am unaware of any discussion of those in the literature, I hypothesize that they likely exist. Metaphoric gestures are quite similar in their form and function to iconic gestures, their basic difference resulting from the fact that iconic gestures pictorialize actual objects, motions, etc. while metaphoric gestures pictorialize abstractions. In all uses, the visual mode of these gesticulations, as well as their use of arrangement and style elements, links them to the broader rhetorical canon of delivery in which they belong.

7.2 Modeling

The last type of gesture I discuss is what I call modeling. As argued in Chapter 5, modeling, in its appearance, is very similar to the practical action it depicts; however, it is a gesture rather than a practical action. Following Kendon's definition of a gesture, modeling is performed under voluntary control and for the purpose of expression rather than having a practical claim. Furthermore, it is "recognized as having an expressive aspect" (Kendon, 2005, p. 9).

I have observed modeling in situations as the instructor demonstrates to students how to perform a particular massage technique or massage routine; how to drape a client to guarantee his/her comfort and modesty while also maintaining the best possible access to the work area for the therapist; and how to position a client to achieve maximum comfort for the client and, at the same time, access for the therapist.

During all these situations, the instructor always accompanies the demonstration with speech, explaining to the students what she is doing and why. In other words, the elements of an action are explained, for example, such as specifying how to perform a massage technique. Furthermore, the instructor often provides additional information about the reasons behind a certain action. For example, in this particular case, she explains that the draped sheets function as a border between client and therapist; the therapist should not breach this border.

The following example (see Figure 7.4) is an extract of a lesson on prenatal massage; the instructor demonstrates to the students different techniques they can perform on a pregnant client in a side-lying position.

Figure 7.4. Instructor demonstrating massage on a student (who pretends to be a pregnant client) by using modeling gestures. (071009T1S20)

Instr.	You can work around the shou::lders,(3.0)	 38278 ((massaging with LH on back/shoulders))
	You can [even get into the neck in a lo:t of good ways. You can stri:p from the shou:lder, all the way up to the occipital ridge. °She got clothes on, that makes it a little bit difficult.°	 38473 ((LH massaging on neck))

	You know.	
	But you have access. Now this opens up to you. You can do ni:ce stretching by stabilizing at the occiput, dra:wing down on the shou:lders,(1.0) This is great work to do with people who ↑aren't pregnant. Just si:deli:ne, when you really wanna open up the ↑neck. Does that feel okay?	 38882  39192

As Figure 7.4 shows, the instructor demonstrates the techniques to the students while explaining in speech what she is doing and why the technique should be used. As two of the instructors explained, none of these performances, in gesture and speech, are completely spontaneous. On the contrary, instructors put a considerable amount of thought into the demonstration to make it as clear as possible to students what is expected of them. I believe that this conscious attention to instruction can be observed in the different speech—gesture relations I have observed. Namely, speech and gesture may occur simultaneously (as in the above example), gesture may precede speech, and, finally, speech may precede gesture.

Figure 7.5 provides an example of a situation in which the instructor begins by aligning speech and gesture but then continues with the demonstration first and later adds explanatory speech.

Figure 7.5. Modeling gestures with different relations to co-occurring speech utterances. (061209T4S7)

	I can take this up all the way to the AS IS, and I'm not having to worry about draping AT A:LL.	 1638 ((continues rhythmic compression))
	(2.0)	 1838 ((continues rhythmic compression))
	°You know°. (7.0)	 1895 ((rhythmic compression up the leg))

		 1950 ((and back down))  2105  2227 ((leans back, stretching))
	I like (..) taking hold of the leg, (.) stretching it. (.) °What's the time? Uh, we are tick tocking away°. (2.0) And the::n,	 2420

	we have this great leg stretching.	 2760

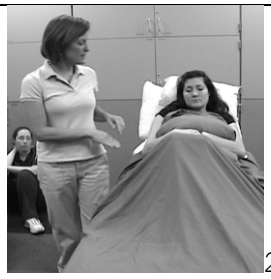
The instructor starts by stretching the student's leg and only then transitions into speech that explains what she is doing. A reason for this behavior may be found in the instructor's familiarity with the action. The instructor is a certified massage therapist with her own massage praxis and spends many hours during the week massaging clients. Therefore, it is easy to assume that massaging for her is an embodied practice. While demonstrating techniques and actions to the students, she might use the natural flow she would usually follow when performing a massage to remind her of the next step she will explain to the students. Hereby, the flow of the embodied practice may function as a memory aid and result in the gesture beginning earlier than the accompanying speech. The flow may also be understood in terms of temporal arrangement (see Chapter 6).

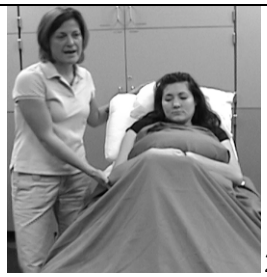
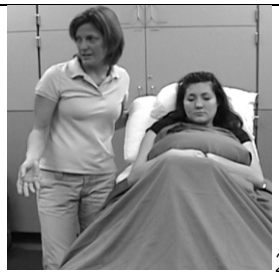
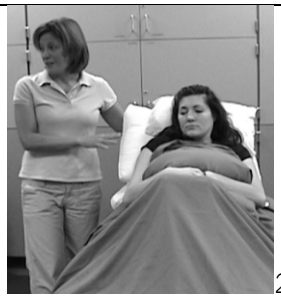
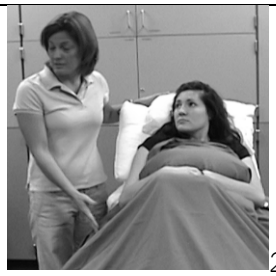
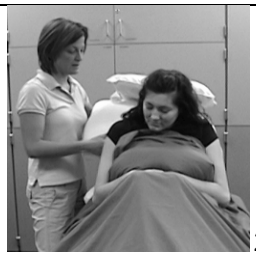
I have not only observed the above mentioned speech—gesture relationships but also interruptions of the modeling gestured by the speaker who may (1) suddenly move into a hold position with one or both hands remaining on the student being massaged while discussing a related topic in speech; or (2) hold with one hand or completely finish the gesture to incorporate other types of gestures which further illustrate the embodied practice. For example, the speaker might introduce mid-air iconic gestures. These

additional gestures often highlight specific aspects of the technique demonstrated or provide information on related topics, such as the type of pillow to use to properly prop up a client.

Holds, where at least one hand remains on the student, may be an action specific to massage therapists. I observed instructors repeatedly encourage students to leave at least one hand on the client at all times when moving around the table. When instructors work on students, they usually follow this rule. However, the hold also appears to fulfill a deictic function. It keeps students and instructors literally connected to the subject at hand. The hold symbolizes that what the instructor explains is related to the topic discussed, although it is not about the technique just modeled. In a sense, then, this is a visual metaphor (see Chapter 6). Oftentimes, the hold is broken when the instructor goes off topic and, then, newly reestablished as a sign that the conversation returns to the topic.

Figure 7.6. Instructor performing a modeling gesture hold. (071009T1S20)

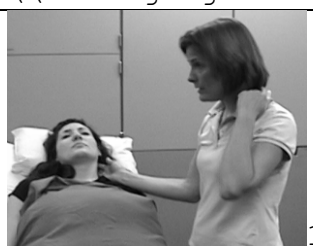
Instr.	Cause you don't want them- It may immediately	 24490

	bring back spasms in	 24538
	if they straighten their legs out. So, advi:se them to go ahead and bend their knees.(2.0) And at the sa:me ti:me, you gotta work with them based on	 24624
	comfort, because you gotta remove those pillows, ri:ght? So:,(..)	 24929
	she may (.) decide to sit up. (.) So, can you sit up just a little bit? There you go.	 25113
	I gonna pull these out, dubdubdudedoo. It's up to her,(.) one pillow or two.(.)	 25315 ((pulling various pillows out))

In Figure 7.6, the instructor explains to the students how to place a pregnant client on the table and how to make her change positions while keeping her comfortable and safe. In the second frame (24538), the instructor has approached the table and performs a deictic gesture with her right hand, pointing at the back of the student who has taken the position of the client. Her left hand, however, is resting on the pillow above the student's head. The instructor's hand keeps resting on the pillow, thereby creating a hold that frames her discussion in relationship to the topic of placing and moving the pregnant client before, in the final frame (25315) helping the "client" to sit up.

In Figure 7.7, the instructor performs a hold with her right hand, while performing a deictic gesture with her left hand.

Figure 7.7. Modeling gesture hold with accompanying deictic gesture. (071009T1S20)

	you can still get the fi:ngers (.) at the occipital ridges, (.) working at the tension (.)	 17981 ((massaging motion))
	that	 18277

	builds up at the base of the ↑ne:ck.	 18350 ((massaging motion))

In the first frame (17981), the instructor can be observed modeling a technique for a client in a back-lying position. In the second frame (18277), the massaging motion stops, but she holds her hand in the position as a hold, while her left hand moves up to her neck, pointing at it. In the third frame, then (18350), the instructor has ended the hold and returns to massaging with her right hand, while her left hand has returned to its resting position.

Two interesting things happen here. First, the instructor interrupts the modeling to provide further information to the students. Here, she explains the function of the massage technique, namely releasing stress at the base of the neck. She maintains the connection to the student on the table, signifying that her discussion is related to the topic. Second, the gesture is asynchronous to the speech. The deictic reference occurs on "that," but is related to the utterances after she finishes the gesture, namely "the base of the neck."

As I have shown, modeling gestures are essential in the transmission of embodied knowledge. They convey and arrange large amounts of information concerning embodied practices when the instructor demonstrates her expert professional knowledge to the students. However, modeling gestures are often combined with a hold sequence that

allows the speaker for one, to (literally) maintain the connection to the primary topic but also to elaborate by providing additional information in speech and gesture. Given this circumstance, I argue that modeling gestures, and with them temporal arrangement, helps to deliver the information. Without gesture, speech would be less efficient in fulfilling its function of representing information.

During modeling sequences, gestures provide the bulk of the information to the onlookers, here students. Spoken utterances frame the demonstration but lack the detail provided in the gesture. In my data collection, modeling sequences stand out in their length compared to other gestures and gesture sequences. They often continue over ten to more than 20 minutes. If this is a defining characteristic of modeling, then these gestures need further study. A possible explanation for the length of the sequences may lie in the nature of massage. A massage is not finished within a few seconds or minutes but actually often lasts for 30 minutes or even up to one hour. In comparison, a tennis stroke or drawing blood are in themselves much shorter procedures. This link between length and action in a modeling gesture requires further research. However, my assumption is that the modeling sequences would differ significantly in length depending on the practical action they demonstrate.

A question that arrives out of the nature of modeling sequences and the notion of temporal arrangement involves where a gesture begins and where one ends. Similar to tapping and beat gestures, only when the whole sequence is considered can meaning be fully transmitted and recognized. Furthermore, as modeling arises out of an actual action,

different movements are not as easily distinguishable from each other as with other gestures.

Based on previous discussion, I argue that modeling gestures are a type of gesture that has not yet been accounted for in gesture taxonomies. They cannot be considered gesticulations since they are not produced spontaneously. First, as two of the instructors explained, they think about how to present the information to the students. Second, although there will be variations between speakers, the gestures they produce look fairly similar. For example, a gesture used to model an effleurage technique[26] will be recognizable as such even if performed by different speakers. Modeling gestures are not speech-linked gestures since the gestures do not fill a grammatical gap in a sentence that was left incomplete by the spoken utterance. They cannot be considered emblems since they do not possess any linguistic properties. They are also not pantomime since they co-occur with speech. Finally, they are not signs because of the co-occurrence of speech and the lack of linguistic qualities, such as syntax, grammar and vocabulary. Therefore, modeling gestures need to be classified as a new type of gesture.

Modeling gestures require an obligatory presence of speech (see Figure 7.8), although the speech may not always begin and end simultaneously with the beginning or end of the gesture. Modeling possesses no linguistic properties (see Figure 7.9). It is, however, partially conventionalized within the culture of massage therapy (see Figure 7.10).

[26] Effleurage is a combination of slow soothing and stroking movements, usually used to warm up the skin and muscles and prepare the body for deeper techniques.

Following this classification, modeling gestures can be placed on Kendon's Continuum (McNeill, 2005, pp. 5-10) as follows.

Gesticulation →	Modeling →	Emblems →	Pantomime →	Sign Language
Obligatory presence of speech	Obligatory presence of speech	Optional presence of speech	Obligatory absence of speech	Obligatory absence of speech

Figure 7.8. Modeling gestures on Kendon's Continuum. Acknowledgement of obligatory presence of speech with modeling gestures.

Gesticulation →	Modeling →	Pantomime →	Emblems →	Sign Language
Linguistic properties absent	Linguistic properties absent	Linguistic properties absent	Some linguistic properties present	Linguistic properties properties present

Figure 7.9. Modeling gestures on Kendon's Continuum. Acknowledgement of the absence of linguistic properties in modeling gestures.

Gesticulation →	Pantomime →	Modeling →	Emblems →	Sign Language
Not conventionalized	Not conventionalized	Partly conventionalized in a particular subculture	Partly conventionalized	Fully conventionalized

Figure 7.10. Modeling gestures on Kendon's Continuum. Acknowledgement of partly conventionalized nature of modeling gestures within a subculture.

Therefore, Kendon's Continuum can be extended as followed (see Figure 7.11):

Gesticulation → Speech-linked gestures → Modeling → Emblems → Pantomime → Signs

Figure 7.11. Extension of Kendon's Continuum by inclusion of modeling gestures.

Recognizing modeling as an independent type of gesture helps clarify how embodied knowledge is transmitted between experts and learners. Modeling allows the expert to demonstrate to learners expert knowledge as an embodied practice without having to rely on spoken or written language alone, language that has shown to be an insufficient medium to represent embodied knowledge. Furthermore, gestures, and modeling in particular, allow the speaker to move beyond other heavily print-linguistic based modes and modalities. For example, modeling demonstrates movement as well as spatial and temporal aspects of these movements in a way that still images cannot capture. In so doing, they function on the level of arrangement. Modeling emerges from an embodied understanding of a specific practice.

I would describe it as the ultimate Character View Point (C-VPT) gesture. According to Sauer (1999), gesturing from a C-VPT mimics the speakers understanding from the inside of a story as the character, where the speaker either narrates from his/her own point of view or takes on the role of another character. As Sauer shows in her study of coal miners, it is the experienced miners who gesture from a C-VPT while inexperienced miners take on an Observer View Point (O-VPT). The O-VPT indicates that the speaker looks at the story from the outside in an analytical manner. In addition, according to Sauer's research, learners benefit when observing an expert gesture from a C-VPT. While modeling provides all the benefits of a C-VPT for an observing learner, it might provide more precise information than a mid-air gesture. As such, modeling simulates the actual action and provides numerous details about the specific situation. For an observing learner, modeling creates an environment that is as close as possible to

witnessing the actual action and, in addition, not only provides the gestural action but also accompanying speech and additional gestures with additional information.

It appears that it is the modeling gesture that carries the bulk of the information. However, speech and additional gestures, combined with modeling, allow the audience to gain more information than from observing the performed modeling gesture only. Therefore, it is always a combination of different modes and modalities that allows embodied knowledge to be transferred. From the rhetorical perspective of delivery, gesture also brings elements of arrangement and style into the mix. Gesture, therefore, plays a crucial role in the representation of embodied knowledge.

This chapter has explored the form and function of deictic-iconic as well as modeling gestures. In so doing, I argue that deictic-iconic gestures combine deictic and iconic gestures, and that only in the combination of both gestures can information be fully represented. Neither kind of gesture alone conveys the same information. In particular, deictic-iconic gestures are a subtype of gesticulation.

Modeling gestures are not currently recognized in gesture taxonomies. This type co-occurs with speech and is often combined with other gestures. As performed, modeling gestures are similar to the actual action they represent and therefore convey embodied practices closely and in the form of visual metaphors. They are, however, most efficient only in combination with speech. The following chapter concludes this study by moving beyond specific gestures to illuminate how different gestures and speech interact with other modes and modalities. In so doing, I hope to make a convincing case that gesture plays an important role in the delivery of embodied knowledge.

CHAPTER 8

Discussion: The Bigger Picture—Combining Embodied Knowledge, Gesture, and Delivery

Having discussed four specific types of gestures, namely tapping, counting, deictic-iconic, and modeling, in the last two chapters, I now provide a larger picture of the relationship between the use and role of gesture and other modes, such as speech, writing, and images. Specifically, I focus on the different ways in which the modes facilitate specific classroom situations, specifically to communicate types of knowledge. To those ends, I rely on Sauer's (1998) categories of sensory information, namely pit sense, engineering experience, and scientific knowledge, to compare and contrast the affordances and constraints of the multiple modes used in each situation to represent the embodied knowledge of massage therapy. As an example, I discuss a class session on trigger point massage[27], a topic that was newly introduced to the students during one afternoon class meeting and engaged the class that day for just over one hour. I begin by laying out the cyclic manner of class activities before discussing the use of and relationship between the different modes; within those activities in particular I consider

[27] "Trigger point massage utilizes ischemic compression of individual areas of hypersensitivity in muscles, ligaments, tendons and fascia. These trigger points are defined by their referral of pain to distant locations in muscles, connective tissues and organs. Janet Travell, M.D., pioneered trigger point therapy in the United States" (Jeremy at 78 Degrees Spa, 2008-2010).

their specific strengths and weaknesses in communicating the information needed for students to acquire the particular knowledge involved at a given moment.

I chose the example of trigger point massage instruction because it is a moment during the instruction when students clearly struggle to gain specific knowledge, for example, when trying to understand how trigger points feel, how to locate them, and how to treat them. I believe that it is moments of disruption like these that reveal the complexities of knowledge acquisition in embodied language transmission situations. In other words, it is in these moments of breakdown that the reciprocal or synergistic relationship between modes is evident. As a result, the instructor's dependence on a combination of different modes to achieve the best possible information transfer becomes visible to the observer. Given that human communication is multimodal (see Chapter 2), it is especially during moments of disruptions that individuals rely on more than one mode, and often, need to engage the body.

The process of instruction on trigger points falls into four distinct parts—first textbook lecture (about twelve minutes of the circa 70 minutes[28] spend on trigger point massage), charts lecture (about eight minutes), hands-on practice (about 38 minutes), and a second textbook lecture (about five minutes). The first and fourth part, the textbook lectures, are similar at first glance but serve distinctive purposes. While the first textbook based instruction introduces students to trigger point massage, the second textbook session at the end of the class calls on students to recall and rehearse knowledge newly

[28] The four parts I describe amount to 63 minutest in total length. The discrepancy to the 70 minutes of total length arise from the following circumstances for which I do not account: change of the videotape, students' relocation to the front of the class to face the charts, students' relocation to the back of the classroom to set up for the hands-on part of the class, and students' return to their seats after the end of the hands-on part.

acquired from the intervening parts of the class session. In other words, the form, content, and purpose of the instruction form a cycle; therefore, the class session should be described as a cyclic event. Although all parts focus on the same topic of instruction, namely trigger point massage, each employs different modes and modalities at different localities in the classroom to be effective for its place in the cycle.

Nexus analysis (Norris, & Jones, 2005; Scollon, & Scollon, 2004) focuses on the cyclic nature of discourse. As a discourse moves through one cycle, or multiple cycles in which it is engaged, social actors, social practices, meditational means, and mediated practices come into play and might change depending on which specific situation within the cycle the discourse belongs. This change is conceptualized through the notion of resemiotization (Iedema, 2003). In what follows, I show how different situations, that is, different parts of the cycle, evoke the use of different modes and modalities by the participants. I observe how information is translated between the different modes and modalities.

I use "translating" here when referring to the presentation of information through different modes and modalities. As Iedema argues, this process of translation is not unproblematic.

> Transposition between different semiotics inevitably introduces a discrepancy that 'goes or points beyond' (metaphorical) the original. Such transposition is not just a matter of finding 'semiotic equivalents' for specific discourse participants in the other semiotic. From my perspective, such equivalence is tenuous, since rematerialization requires new resource investments; restructuring derives from

> different expertises and literacies, and resemiotization opens up different modalities of human experience. (Iedema, 2003, p. 48)

In other words, the translation process changes the information that is represented. Depending on each particular situation, this change might be more or less substantial. Therefore, one should consider if the information represented though different modes and modalities is still the same information after the translation. Given the circumstances of the particular environment I observe, I acknowledge that the information represented and translated might change depending on the mode or modality through which it is presented. However, since producer and audience, that is instructor and students, as well as the setting, that is the classroom setting, remain the same, I believe that the translation process is not as radical at it might be in other situations where audiences or settings themselves change. To that end, I acknowledge and question the affordances and constraints of different modes and modalities but treat information that is translated between them as essentially the same. I discuss the modes and modalities employed, and how they support (or hinder) the effective representation of knowledge.

8.1 Lesson Cycle as a Whole

As during other typical textbook lecture sessions, students are seated behind their tables with textbooks opened in front of them. The instructor faces the class behind a lectern on which she has propped up her opened textbook. When reading from the textbook, she steps away from the lectern frequently to elaborate on the material through speech and gesture. This structure is also used in this particular situation of trigger point instruction. The lesson on trigger points begins with instructor and students reviewing

textbooks and, aided by those texts, considering the history and basic philosophy behind trigger point therapy.

After the initial introduction to the topic, the instructor calls the students to the front of the class where she has located two trigger point reference charts. The charts, which are primarily image based, display models of the human body from front and back and also enlarge certain body parts to depict pain areas and corresponding trigger points. Similar to the first part of the lecture, the instructor contributes the major part of the discussion; she uses speech and gesture to discuss the content of the charts with the students.

After examining and discussing the charts, the class moves to the back of the room where students practice locating and treating trigger points. In comparison to lessons that cover material with which students are already somewhat familiar, the students ask a comparatively high volume of questions during the first part of the lesson, both to the instructor and each other. But, when they begin to practice, discussion increases even more; the interactions incorporate speech, gesture, images, and bodies.

Finally, students and instructor return to the lecture setting and the instruction on trigger point massage, at least for the day, is wrapped up by returning to textbooks and revisiting the material they contain. What differentiates this second lecture session from the first is that the instructor now discusses the appearance and techniques of trigger points much more specifically, frequently referring back to the experiences students gained during the hands-on session. Although speech and gesture are present in all four situations, their use and function appears to be distinctly different. I discuss this

observation in more detail in what follows.

8.2 *Part 1:* First Textbook Lecture

Initially, the instruction on trigger points is marked by a relatively short, twelve minute textbook based lecture. The instruction focuses on defining trigger points and introducing the different types of trigger points, such as primary, satellite and associate trigger points, and the similarities and differences between them. The instructor stays physically close to the textbook and reads out loud longer passages as the students follow along; no gesturing occurs while the instructor reads. Even during periods of supplementary explanations during which the instructor elaborates on the text and provides examples from her own massage therapy practice, very little gesturing accompanies her speech. Only later, as she moves away from definitional issues to the history of trigger point massage and establishes that the procedure is a very complex topic, does she also produce more gestures. The instructor, for example, points out that Travell and Simons' (Simons, Travell, & Simons, 1998) published two large volumes on trigger points with font as small as dictionary print. In this short discussion, she establishes the names of two important researchers with whom the students should be familiar and reinforces how complex the topic is, indicating not only that two volumes were necessary to hold the information but also that very small print was needed to include the vast amount of information. To emphasize this further, she uses iconic gestures indicating the size of the volumes and the type font (see Figure 8.1).

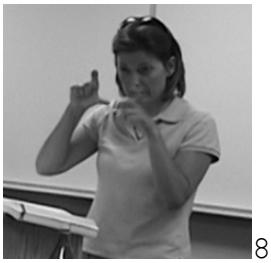
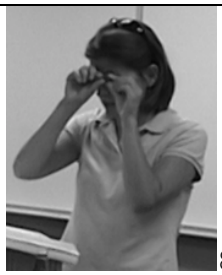
two volume:s about trigger point work.	 549
In like Webster dictionary size	 815  854
type. ((laughs)) You know?	

Figure 8.1. Instructor uses iconic gestures to indicate the size of Travell and Simons' (Simons, Travell, & Simons, 1998) publication and the font size used. (071009T3S10)

As the instructor reads from the textbook, she repeatedly pauses to explain to the students what she has just read; in so doing, she often uses deictic (pointing) and deictic-tapping gestures (rhythmic or audible deictic gestures with single taps or repeated tapping) that serve different purposes. For one, she uses deictic and deictic-tapping gestures as a device to point at a specific paragraph in the book, although the students cannot see the place at which she is pointing. She also taps on a page or uses a circular motion across the page while referring in speech to that page, the chapter, or even the textbook's content. In other words, instead of referring to a particular location in the book, this motion refers to the content. Therefore, this second tapping gesture could be described as "abstract pointing" (McNeill, 2005, p. 40). McNeill (2005) points out that

"much of the pointing we see in adult conversation and storytelling is not pointing at physically present objects or locations but is instead *abstract pointing*" (p. 40; emphasis in original). He later continues, "Abstract deixis *creates* new references in space; concrete deixis *finds* references in it" (p. 40; emphasis in original). By tapping on the book in an abstract deictic manner, the instructor creates a metaphorical space containing a certain amount of knowledge to which she now points in speech and gesture.

As mentioned earlier, the first textbook lecture session never addresses specifically how trigger points feel, how they can be located, and how it feels to treat them. However, in this lecture, instructor and students discuss how a person might develop trigger points and what effect those might have on an individual's range of motion. To explain these more complex ideas, the instructor steps away from the textbook and the lectern. In Figure 8.2, taken from the beginning of instruction on trigger points, the instructor illustrates how a trigger point in the bicep muscle may also affect the work of the triceps muscle, the antagonist muscle to the biceps. In frame 92, she steps away from the textbook and lectern, while engaging a combination of deictic and iconic gestures to demonstrate the movements of bicep and triceps muscle necessary to extend the elbow.

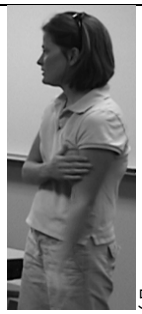
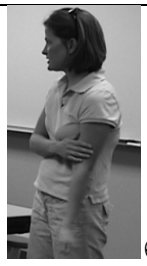
So, (.) I could ha:ve (.) a: primary trigger point in my bicep muscle. (.) Right? (.) That maybe is preventing	 92
full motion-	 491
(.)	 554  574
full	 600
extension of the elbow.	 626

Figure 8.2. Instructor demonstrating how a trigger point may affect the function of a muscle. (071009T3S7)

Hereby, the deictic gesture of the right hand points to the location of the (assumed) trigger point, the knot that can affect the full function of bicep and triceps muscle. Through an iconic gesture, the entire left arm illustrates the movements of the muscles, and, therefore, the extension of the elbow. The instructor employs multiple modes, namely speech and gesture, to represent the new information to the students.

While the students might be able to glean the gist of the information from the instruction without the instructor's use of gesture, the gesture clearly supports and enhances the information represented in speech. As Valenzeno, Alibali, and Klatzky (2003) argue, the use of gesture not only helps to retain the students' attention to the instruction but also facilitates students' learning because gestures "*ground speech in the concrete, physical environment*" (p. 200; emphasis in original), or, what Sauer terms pit sense. In other words, the instructor's use of speech and gestures seems to support students' understanding of the instructional material by addressing multiple senses, and, therefore, ways of learning.

Shortly after, the instructor's speech shifts from describing the movements of the muscles and the extension of the joint to covering the anticipated activity of treating trigger points through massage. This content shift is also made visible in the gesture. In Figure 8.3, she holds her left hand in an iconic gesture (iconic gestures are of a pictorial quality and depict actual objects or actions) in a fist-like form with the thumb on top (see frame 2651) as if she was working on a trigger point. In frame 2651, she also uses her right hand to point at her own left hand, which is still in the same form as if she was

massaging; in so doing, she points to the possibility that the massage therapist may feel a trigger point release right underneath his/her thumb during treatment.

re[lea]se [under] [your thumb],	 2651 ((pointing at thumb))

Figure 8.3. Instructor using a deictic-iconic gesture while discussing trigger point massage. (071009T3S7)

Interestingly, at this point, the class has not yet discussed how a massage therapist has to use her/his hands and fingers during trigger point massage. Only later, during the practical parts of the lesson, will students learn that they sink single fingers into the trigger point, similar to the iconic gesture the instructor performs here. Although the instructor's speech and gesture match, I cannot yet ascertain how much students pick up on the information embodied in the gesture itself. In other words, I do not know if students are aware that the instructor is holding her hand in a position here as if treating a trigger point and, therefore, are able to translate the gestural information presented into newly acquired knowledge about trigger point massage.

Studies with untrained adult observers have shown that they are able to "pick up" on children's gesture-speech matches and mismatches. Furthermore, observers assessed children with mismatches as having a better understanding of the task at hand and a readiness to learn (Fletcher, & Pine, 2006; Goldin-Meadow, 2005). Goldin-Meadow (2005) confirmed these evaluations by showing that children who demonstrated gesture-speech mismatches and received tutoring were indeed able to learn, whereas children who showed gesture-speech matches were not. Although these studies indicate that untrained adult observers are able to discern gesture-speech matches and mismatches, they cannot answer the question if untrained adult learners are able to recognize gesture-speech matches in a manner that allows them to gain valuable information for their learning experience.

Other researchers have specifically studied untrained adults' abilities to recognize position and size information encoded in iconic gestures but not explicitly communicated in speech in situations in which participants watched narrations of cartoon stories in videotaped situations (McNeill, 1992) or in face-to-face situations (Holler, Shovelton, & Beattie, 2009). In both studies, the participants had to understand information encoded in speech and other information encoded in gesture to fully understand the content of the narration. Both studies found that participants were able to do so.

These studies suggest that adults, even when they are untrained, are able to "read" information encoded in iconic gestures. However, these studies have been undertaken in experimental lab settings in which the participants' only task was to observe others without further distractions. A real-time classroom setting holds much more distractions

than a laboratory. Furthermore, communication outside a laboratory experiment is spontaneous and not deliberately chosen by a researcher to test a specific hypothesis. In other words, real-life situations are "messier" than controlled laboratory experiments. Finally, while the information encoded in the laboratory settings is fairly simple (the narration of a cartoon), the information encoded by the instructor is highly specific and not common knowledge.

In sum, the situation in which my students observe the instructor is more complex than the laboratory setting; therefore, I cannot unquestionably conclude that they gather information from the gesture that is not explicitly referred to in speech. Nevertheless, existing research suggests that untrained adults are able to gain information from iconic gestures and, as such, indicates that the observed students are able to do the same. In a future study, it would be interesting to examine the extent to which students perceive the knowledge communicated through gesture but not explicitly acknowledged in speech. However, I think this example shows how the instructor has embodied the knowledge so that as she describes the action to the students she instinctively moves her hand into the position she assumes during a massage; thereby she offers different aspects of information in different modes. I discuss the question of resemiotization toward the end of this chapter.

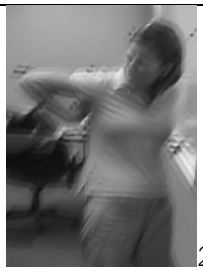
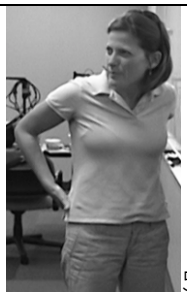
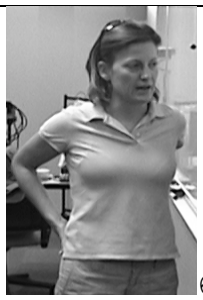
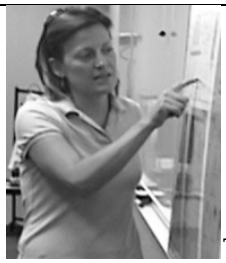
8.3 *Part 2:* Chart Lecture

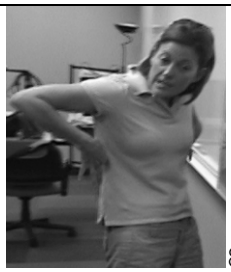
Students and instructor spend about twelve minutes with the textbook before moving onto the second part of the instruction, which takes up even less time than the first textbook lecture at only eight minutes. Discussing the charts allows the instructor to

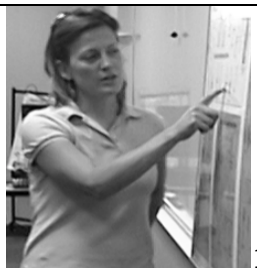
discuss the actual feel of trigger points and trigger point massage more specifically. While the instructor explains the charts to the students and answers their questions, I observed a shift in her gestures. To explain trigger points and trigger point massage, she now uses significantly more deictic gestures than during any other part of the lesson, here to refer to the charts and her own body. More specifically, during the eight minutes of chart lecture, she produces a total of 53 touch gestures, of which 46 are deictic and two deictic-tapping gestures. This frequency never reoccurs during any other part of the lecture cycle. The second highest amount of deictic gestures can be found during the 38 minutes hands-on part with 40 deictic, 11 deictic-tapping and six deictic-iconic gestures (out of a total of 99 touch gestures). In other words, the chart lecture combines speech, gesture, and visuals (images and the human body). It appears that gesture's main function is to translate the information relayed through speech into a visual representation of it. Similar to what I observed during the first textbook lecture, gesture functions to ground abstract concepts in a physical reality, as detailed by Valenzeno, Alibali, and Klatzky (2003).

Figure 8.4 exemplifies how the instructor relies on different modes and modalities and interconnects them for the purpose of instruction. She begins by (literally) pointing out common pain areas on the trigger point chart. While the speech provides the narration, the gesture associates that spoken language to a schematic image on the board and then illustrates the same pain area on the actual human. All three modalities, speech, gesture, and image, convey the same information in different forms.

Figure 8.4. A combination of speech, gesture, and image contributes to the transmission of embodied knowledge. (071009T3S12a)

Lot of people have pai:n across the back in two areas.	 125
They'll say, ["You know, it's between my shoulder- just beneath my shoulder plates he:re]	 288 ((motioning on own back in shoulder area))
and then my lower back."	 504 ((motioning on lower back area))
It's really commo:n that people present with that.	 658
And it's not like [they- they've seen that and go],	 716

"it's here	 807 ((moves across area with hands, pulling hands apart))
and it's here,"	 854 ((moves across area with hands, pulling hands apart))
but they say, "my lower back,	 939
and my hips, and it's-"	 963

The trigger point for treating those, where do you see those?	 1031

Also interesting, in instructing and preparing future massage therapists to treat clients, the instructor not only points out the different pain areas but also demonstrates how a potential client might discuss his/her pain. She also shows how the massage therapist then translates this spoken and visual information into an understanding of what trigger points may be by means of her and other's experiences as well as the charts. The instructor not only draws on her own embodied experience of pain and trigger point massage but also on the embodied (pain) experience of others (here, former clients) to educate her students about trigger points.

At other times, the instructor translates the visual information from the image on the chart into a visual image through the use of metaphoric gesture. Figure 8.5 shows how during a discussion on pain referral zones, she spreads her fingers to illustrate an "almost […] finger-like projection" of the pain.

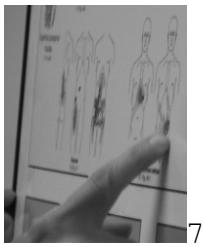
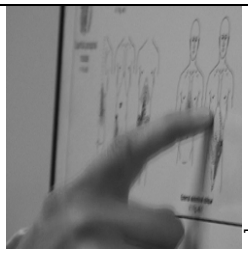
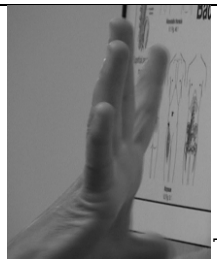
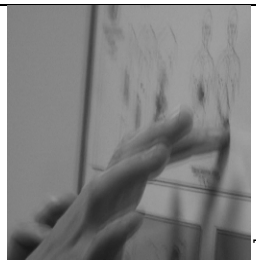
This also gonna spread up to the ribs, across the a:bdomen,	 7742  7838
in almost like a	 7919
finger-like	 7948 ((quick upward motion with index finger over red area))
projection. (1.0)	 8000

Figure 8.5. Use of a metaphoric gesture. (071009T3S12a)

Furthermore, this example illustrates how she employs different modalities in quick succession to transmit the information to teach her students in varied forms and learning styles. In particular, she moves from pointing at the image and the pain zone illustrated through it, to a quick metaphoric gesture; finally she moves back to pointing at

the image and pain zone. Thus, different types of gestures, here specifically the deictic and metaphoric gesture, fulfill different "jobs." In the instance of the deictic gesture, the gesture aids and guides the students' eyes to the part of the chart where the image to which the instructor refers in her speech is located. In contrast, during the metaphoric gesture, the gesture itself captures the imagery that is discussed in speech and constitutes the focal point of the instruction.

As the instructor lectures about trigger points, students are able to interrupt her with questions that help them to clarify information. For example, one of the students asks the question, "How do you know that you are hitting the trigger point […]," to which another student replies, "Because it's gonna be sore. The trigger point in itself." The instructor immediately echoes, "You [*sic*] gonna feel a nodule and it will be sore. You know" (see Figure 8.6). To illustrate, the instructor again holds her right hand in an iconic gesture, in the fist like shape with the thumb on the outside on top as if treating a trigger point.

You gonna feel a nodule and it will be sore. You know.	 11210

Figure 8.6. Instructor-student interaction in speech and gesture. (071009T3S12b)

This short exchange opens the discussion in which the instructor encourages the students to locate a trigger point "high up on the rib cage" by orienting themselves on the charts at which the instructor keeps pointing. Only after several students indicate that they are finding the trigger point, "It works!," does the instructor use her own body to show how a trigger point might be located.

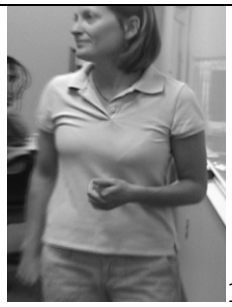
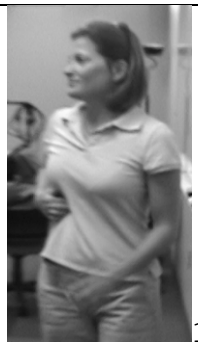
Monica	It does! How often can you say,	 12869
	Oh, I just gonna play around right here.	 12893

Figure 8.7. Instructor's use of pantomime to accompany a student's speech and gesture. (071009T3S12b)

Interestingly, in Figure 8.7, the instructor uses pantomime, that is, gestures without speaking, while her gesture accompanies the speech of a student who discusses locating trigger points in a playful manner. McNeill (2005) discusses what he terms "gesture sharing," an aspect of gesture that he describes in two distinct forms: "mimicry"

and “appropriation” (p. 159). During mimicry, the second speaker imitates the first speaker’s gesture’s imagery when it is her/his turn to speak after the first speaker finished. “From a GP viewpoint, the second speaker’s idea unit included imagery from the first speaker’s GP” (p. 161). It “creates a sense of solidarity and is prominent when the interlocutors are personally close” (p. 160).

While similar to mimicry, appropriation can be observed between formerly unacquainted interlocutors. McNeill (2005) provides an example from Nobuhiro Furuyama’s research (2000) on a tutor teaching another person to perform a manipulation. While the tutor speaks and gestures, the learner mimics the tutor’s gesture without speech. “The learner thus appropriated the other’s *speech* by combining it with her *gesture*, and in this way inhabited the speech of another, with the help of the gesture, as if they were jointly creating a single GP” (p. 161; emphasis in original).

In the situation I observed, it is the instructor who appropriates the students’ speech and gesture, thereby creating a joint GP. McNeill and Furuyama argue that the creation of a joint GP helps the learner learn. I can only speculate that the instructor’s appropriation of the student’s speech and gesture might help her understand what the student is feeling, understanding, and therefore learning. On the other hand, perhaps the gesture is simply the instructor’s way to bring the class’ focus back to herself and the topic at hand and away from the joking that briefly disturbed the class.

Also of note, the student replies to the instructor that she can identify the trigger point on her own body and seems to do so with ease. However, when the hands-on part of the lesson arrives, the time during which students practice on each other, she is one of the

students who struggles the most. This observation supports the notion of embodied knowledge as taking place in "specific physical spaces" (Haas, & Witte, 2001). Different bodies are different physical spaces and most, if not all humans, are most familiar with their own bodies. What seems to be taking place here is that the student is able to perform a newly acquired skill, namely locating a trigger point, in the space she is most familiar with, that is her own body. However, she needs further practice to perform the same action in spaces with which she is not readily familiar.

8.4 *Part 3:* Hands-On Practice

The hands-on practice session, at 38 minutes, is by far the longest part of the class meeting. As in other hands-on teaching demonstrations that I observed throughout my time in the classroom, the use of gesture and speech shifts remarkably in this stage of the cycle in comparison to the lecture setting. The instructor now employs modeling gestures, a type of gesture that never appeared during the textbook or chart lecture settings. As described in Chapter 5, modeling gestures co-occur with speech and are very similar to the actual practical action they depict. Furthermore, modeling gestures are often extended into a hold that then allows the instructor to explain additional elements in the instructional material.

The following transcripts are taken from five minutes of one-on-one interaction that played out between the instructor and the student, who, during the chart lecture, seemed to have no problems with locating trigger points on herself but struggled with locating trigger points on others. The instructor begins helping the student to understand trigger points by modeling the technique with her right hand; she keeps that hand in a

hold on the practiced on student, and uses her left hand to further visualize the appearance of a trigger point (see Figure 8.8).

Figure 8.8. Instructor using modeling and modeling hold. (071009T321a)

Instr.	And you are looking- <Sometimes it won't	 2917
	be> a clear nodule. Sometimes it may just feel like	 2995 ((forms ring between index & thumb))
	a restriction of the fibers that are pulling to the center. And it's not	 3140

	giving you a clear, bean-shaped (.) nodu:le. But you can still feel like (.) there is this center,	 3353 ((forms ring with index & thumb))
	and it's pulling together,	 3698
	like it's pulling up.	 3756
	(.) Uhm.	 3811

The instructor combines metaphoric language ("bean-shaped," "pulling up") and iconic gestures presumably to translate the "feel" of what she senses through touching the

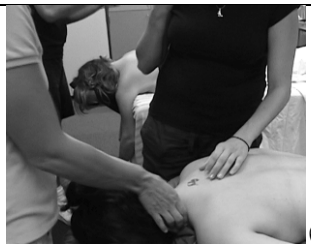
other body and experiences mediated by means of her own body's senses. Next, she invites the student to experience what she just described; she instructs her to press slightly and see if she feels a difference.

> Just kinda go along, like feel what this section feels like, what this section looks like and then see if you don't notice a difference. And I'm not even pressing much in here, I'm just moving the skin across the neck muscles. And see if you don't feel something different here, than you do down here.

While she gives these instructions to the student, the instructor moves her hand across the other student's neck to demonstrate where she wants her to feel and explore the body. However, after about five seconds, the student replies, "See, I can't. I don't know."

The instructor tries anew to help the student (see Figure 8.9). This time she offers more specific details about what she is looking for.

Figure 8.9. Instructor-student one-on-one interaction in speech and gesture. (071009T321a)

Okay. Let's see. Let's try again.(.) So here the skin is kinda moving slo:wly back and forth. (.) I get here,	 6830 ((small movement with thumb))

and you can even see,	 7119
the skin is creasing.	 7154

To that end, she uses her right hand to model the technique while using her left hand to point at the specific visual clues she would like the student to recognize as signs of an underlying trigger point.

The instructor then further breaks down the process of locating a trigger point by slowing down the movement she is demonstrating, a movement that the massage therapist needs to perform across the skin; she uses speech to indicate what she is experiencing through her sense of touch (see Figure 8.10). The modeling gesture hereby also acquires a deictic quality, as the instructor is not only able to demonstrate the massage gesture; while doing so, she is also able to point out where the student has to watch the client's body and where the student has to place her hand to see and feel changes in the underlying tissue. Because of the slowness of the movement, the instructor cannot only illustrate the appearance of the technique but also what is happening underneath the skin, when, and where. In other words, combining gesture and speech allows her to impart to her student an impression of what she feels and what is happening

below the skin level, away from what can be perceived by the human eye. Accordingly, she teaches the student how the muscle and trigger points below the skin translate into a visual experience, an experience that can be perceived by the human eye without the aid of any technologies. The instructor combines her own speech and gesture with tactile and visual information created on and through the body.

Figure 8.10. Instructor using speech, gesture, visual, and tactile information. (071009T321a)

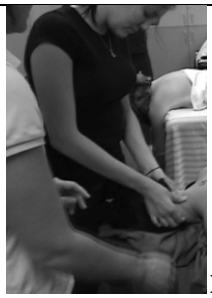
You can even see (.) superficial changes,	 7275 ((moves index finger and thumb over area))
that ma:y be an indication. Even if you ta:ke your finger across here,	 7479 ((slides index finger upwards repeatedly))
smooth,	 7517

smooth, smooth, and then something begins to happen right in there. (4.0)	 7540 ((moves index finger up slowly))

The interaction continues for a few more minutes with the instructor relying on the combination of the different modes (speech, gesture, visuals, and tactile information); the instructor also encourages the struggling student to experience the visual and tactile sensations herself after she explains and demonstrates them to her.

While the student is trying to understand the tactile sensation she is supposed to feel, the instructor even uses the student's own hand to explore the spot on the body with the student (see Figure 8.11); in so doing, she can better understand what the student is feeling at the moment and give her additional directions.

Figure 8.11. Instructor using student's hand to further help her understand tactile information. (071009T3S21b)

Instr.	See, okay. So now you have	 16094

	something to compare it to.	 16140 ((small movements))
	So you can go, alright, now I know what that feels like. So okay	 16200 ((small movements))
	now there is resistance here, so I'll sink in here. (.)	 16302 ((small movements))
	And see what happens.	 16412

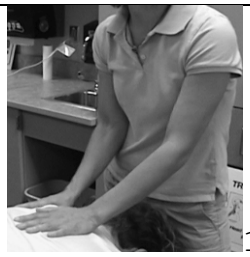
After the instructor leaves the student to practice on her own, it takes the student another four to five minutes until she exclaims triumphantly, "I felt it! I felt it! I felt it! I felt it! I felt it!" Thereby she indicates her ability to locate and release a trigger point in a physical space other than her own body.

It is not always the instructor who enters the student's space to explore with the student together what s/he is feeling; this exchange also happens the other way around

with the student taking his/her hand to the spot where the instructor's hands are, to explore what the instructor is feeling. These interchanges may happen with the instructor explicitly asking the student to place her/his hand where hers is or with the student simply performing this move to gain a better understanding of the situation.

Figure 8.12 is a typical situation in which the instructor invites the student to "take your thumb and just kinda hold it right in there." She follows the instructor's direction, feels the spot but then removes her hand again as the instructor continues to explain.

Figure 8.12. Instructor and student exploring tactile information. (071009T3S24)

Okay. (4.0) You finding it? (3.0) Okay,	 10837 ((small movements with RH thumb))
(.) take your thu:mb and just kinda ho:ld it right in there and you may even feel like you wanna kinda press i::n	 11349
and that way	 11583

	 11604  11625
so it’s not	 11659
directly in	 11694
but there’s a tiny bit of a	 11729
Drag	 11779

that way.	 11820

However, in Figure 8.13, it is the student who initiates the combined effort of experiencing together with the instructor tactile and visual sensations before practicing her technique as the instructor moves away.

Figure 8.13. Student initiated instructor-student interaction to explore tactile and visual information. (071009T3S25)

Okay. (.)	 2334
So it's a little scavenger hu:nt, but °right° (.) <in there,> (.)	 2453

and I'm actually pressing down and a little this way.	 2529
(1.0)	 2655

As these different examples make clear, gesture itself is not only a crucial element in the transmission and acquisition of embodied knowledge; each mode also contributes to the knowledge exchange in its own unique way. Each mode, therefore, is indispensible.

8.5 *Part 4:* Second Textbook Lecture

The fourth and final part of the instruction on trigger point massage is the second textbook lecture. While the first textbook lecture introduces the topic, the second ties up loose ends by now (re-)connecting students' newly acquired corporal understanding to a more academic, scientific knowledge as displayed in the textbook.

In her study *The textual representation of embodied sensory information in a dynamic and uncertain material environment*, Sauer (1998) observes how vitally important, embodied information is communicated in texts, this is, information that coal miners must develop to survive in the mines is communicated in text. On that basis, she

develops a framework and terminology that addresses "three different categories of sensory information [that miners, engineers, and scientists draw on] to assess risk and hazard in the mines" (p. 134). The three categories are as follows:

1. *pit sense* (embodied sensory knowledge): direct physical sensations felt or perceived in highly specific local environments. Miners feel or sense this knowledge as physical signs or sensations in their bodies.
2. *engineering experience*: physical signs or indexes embodied in objects and materials. Engineers observe and recorded this information as the material history of particular sites.
3. *scientific or invisible knowledge*: physical forces, particles, materials, and interactions that are sensed or perceived as data in language, physical tracings, and inscriptions. Scientists read and interpret data to formulate knowledge that is literally invisible to the physical senses (p. 134).

While Sauer's terminology is clearly concerned with and aimed at the mining industry, I argue that her three categories of sensory information can be translated into other environments (such as my study's massage therapy environment). Instruction on pit sense and scientific knowledge are observable in the four parts of the lesson on trigger point massage.

What Sauer terms "pit sense" is very similar to what massage therapists and massage therapists in training experience when working on a client. While working on a client, massage therapists perceive direct physical sensations, such as softness or

hardening of a muscle, and knots and nodules palpable underneath the skin. Students acquire pit sense during their hands-on practice. “Engineering experience” is comparable to the information that massage therapists preserve in patient records. Although I did not observe this activity directly during my study, instructors and students sometimes referred to the process of recording patient information, and I know that students learn the practice during their required clinical training. Finally, “scientific or invisible knowledge” is akin to the information recorded in the textbook used during class time or Travell and Simons’ (Simons, Travell, & Simons, 1998) manual on trigger points. Here, embodied information is encoded in language and, as described by Sauer, “literally invisible to the physical senses” (p. 134).

For the instructor, the move between direct physical experience, engineering experience (although not directly observed by me), and scientific knowledge seems to be a conscious one. In her speech, she connects textbook (scientific knowledge) to embodied practice (pit sense); as such she reinforces newly acquired knowledge through reciting textbook information and reminding students about their own physical experiences. For example,

> Travell and Simons’ suggest applying digital pressure to the point- to the point until a restrictive barrier is approached. And that’s what I was talking about when I would come around and say, “Until it just stops.” There’s a natural stopping place that you’re not going to press beyond.

Such discussion may not only remind students what they have learned since they began studying the topic, but it may likely also help students to link written textual information

to actual sensual, bodily experiences. Information presented through different modes and modalities, here for example through speech and gesture as well as through textbook writing and images, may not appear "the same" to a learner. While the instructor is aware that the sensual information experienced through her own body as pit sense is "the same" as that presented in print text as scientific knowledge, a learner may not be aware of this translation process. Students may not yet be able to elicit their embodied experiences in a way that allows them to generalize and recognize them in the form of scientific knowledge. However, students must be able to perform this step when taking exams, which are presented to them as multiple choice written tests and not physical exercises. As the instructor once told me, some students are great physical learners and performers, yet struggle with more theoretical, text-based approaches to the knowledge they need to have to pass their exams. However, others have an easier time studying and understanding textbook knowledge, yet struggle to translate this knowledge into a physical performance. Yet, according to the instructor, ideally the school would like their students to understand, and I would use the word "embody" here, knowledge pertaining to massage therapy in both realms, the physical, and the textual.

It is not just in speech that the instructor connects students' physical experiences, in other words, pit sense, and scientific knowledge. In Figure 8.14, the instructor refers back to a technique she had introduced earlier during the hands-on session in which massage therapists shortens the muscle to relieve pain. The instructor uses an iconic gesture (frame 306) that illustrates the movement:

I showed you some positional release to inactivate the trigger points. That's what we were doing-	
taking the muscle(1.0) into a pl:ace where that pai- <You find	 306
the pain>(..)	
shorten the muscle until there is no pain, hold it until it releases. That was happening very well on Monica's back (1.0) along the inside border of the shoulder blade.	

Figure 8.14. Instructor's use of speech and iconic gesture to remind students of physical experience. (071009T4S5)

The actual hands-on modeling looks quite similar (Figure 8.15):

((Beginning of tape)) Alright, you take it to the point where there is less pai:n. (.) Hold. Breathe. (3.0)You're still applying the same amount of pressure. Nothing has changed. (3.0) This is one you can hold for a minute. (5.0) Can you feel any pain?	 143

Figure 8.15. Modeling gesture. (071009T4S1)

The instructor refers back to the physical experience in speech. In addition, she gestures, thereby reinforcing recently learned material, "scientific knowledge." The iconic gesture allows her to translate the scientific knowledge that cannot be perceived through the senses into embodied sensory knowledge that is directly relatable to actual physical experiences.

In addition, similar to Figure 8.3 during the first lecture session, the instructor's iconic gesture illustrates the form of a particular massage technique. This information is not communicated specifically through the speech but only through the gesture. In contrast to the first example I provided, students should now be familiar with the appearance of the actual technique to which she refers. However, as with the previously discussed situation, I cannot comment on the probability of students' ability to "read" the information encoded in the gesture beyond referring to the studies above that would suggest that students should be now able to do so.

Although the instructor does not justify to the class her decisions on when and how to address particular aspects of the topic of trigger point massage, she seems to be aware and understand what students already know and how that knowledge can be supported and further developed. Specifically, the instructor and the massage therapy program administrators seem to understand that to embody the knowledge of massage, learners need to be exposed to information in more than just one mode or modality.

This understanding is not only visible in the instruction on trigger point massage detailed above but also in the composition and curriculum of the massage therapy program at large. Students are exposed, to speak in Sauer's terminology, to scientific knowledge through lectures in the classroom that are heavily based on textbooks and PowerPoint presentations. These media are primarily language based in written and spoken form. In addition, images, charts, and plastic models of, for instance, the human skeleton and muscle structure, enrich the educational environment. These visual aids enrich and support the language centered frontal-teaching instruction. Here, students learn certain aspects of human physiology and medical issues.

At the same time, the program also offers a strong focus on students' hands-on experience. These experiences, which begin in the classroom, are then continued through 40 hours of practice at the school's internal massage clinic, 10 hours of practice in the community, and 50 hours of practice on friends and family. In these environments, students are exposed to and familiarized with engineering experience, for example, by writing patient notes. Pit sense happens as they experience other bodies through the use of their own bodies; aided by speech and gesture as they communicate with each other,

instructors and clients, students receive advice and feedback. All three categories, pit sense, engineering experience, and scientific knowledge, are necessary to provide the best possible learning environment for the students.

On a side note, I find it very interesting that the English and German languages (and probably other languages as well) seem to conceptualize the notion of embodiment in an embodied manner. In English, the word "grasp" can be used to describe the action of touching something with ones hands; at the same time, it also describes the idea of understanding and comprehending something. Similarly, German uses two words, namely "greifen" and "begreifen." Both greifen and begreifen mean to touch something, to grasp something with ones hands whereas begreifen also refers to understanding and comprehending. In other words, following Lakoff and Johnson's (1999, 2003) notion that metaphor and metaphorical expressions are based on human sensual and cultural experiences in the physical world, I would like to argue that humans possess an understanding of the acquisition of embodied knowledge as one based in actual physical performances and bodily experiences. Embodied knowledge cannot be acquired through the study of scientific knowledge alone. Yet, students need an understanding of scientific knowledge to fully comprehend what their senses are telling them as they experience sensations through their bodies.

Finally, a last topic I feel that needs to be addressed is "resemiotization." Iedema (2003) defines the process of resemiotization as being "about how meaning making shifts from context to context, from practice to practice, or from one stage of a practice to the next" (p. 41). As exemplified in this chapter on the topic of instruction on trigger point

massage, instructor and students employ numerous modes to instruct and learn about the topic. From Iedema's perspective, information is resemiotized as shifts in meaning are embodied or made evident as different modes each of which serves different affordances and constraints. However, one question that needs to be considered, although I cannot answer it in this study, is, if the information that gets resemiotized is actually the same information dressed up in different clothing, so to speak, or is it different information represented through the different modes. Maybe the answer lies somewhere in the middle between both extremes.

To return to my example of trigger point massage, during every part of the lesson the information provided clearly centered on trigger point massage and presented the topic from different angles. Consequently, different modes contributed in unique ways to the creation of meaning. For example, language used during the textbook lecture provided scientific, medical knowledge about trigger points that students cannot experience as physical information sensed through their bodies. At the same time, language cannot translate how a trigger point feels in the muscles of a human body; students need to undergo the actual bodily experience.

8.6 Conclusion

At this point, let me offer a few comments on embodied knowledge, to integrate this chapter with the two previous ones on gesture and delivery. Chapters 6 and 7 demonstrated how gesture incorporates within it elements of style, arrangement, and memory. In so doing and with the help of various modes, gesture is a crucial aspect of delivery. These elements of gesture, the temporal arrangement, and the repetition of

movements and sounds, also contribute to the representation of embodied knowledge. In particular, modeling epitomizes this ability of gesture to represent embodied knowledge through not only the aforementioned qualities but furthermore through its appearance, which is close to the embodied practice it depicts. While gestures play an important role in the representation of embodied knowledge, they clearly cannot fulfill the task alone; speech, images, and other modes and modalities all contribute to the learning experience. However, I argue that without gesture, the representation of embodied knowledge would be far less efficient. Enhancing our understanding of how gesture functions will, in turn, enhance our understanding of the representation of embodied knowledge. Despite the development of print linguistic and more recently electronic technologies, gesture and delivery have not become obsolete. A consideration of gesture and delivery should therefore return to rhetorical studies.

CHAPTER 9

Conclusion and Future Outlook

9.1 Overview

This study began as an investigation designed to better understand how gesture, considered since Antiquity to be an element of delivery, is used in human interaction as well as what role it plays in the representation of embodied knowledge. To that end, Chapter 2 revisited the literature and brought together studies in separate fields, specifically Gesture Studies and rhetoric. I argued that gesture is not merely ornamental but belongs to argument and, therefore, that delivery and gesture deserve more attention in the study of rhetoric.

Chapter 3 then explored ways to reintroduce gesture into studies of delivery. For that purpose, I focused on Halliday's theory of systemic functional linguistics and its extension into multimodality by scholars such as Kress, van Leeuwen, and the New London Group. Mediated Discourse Analysis served as heuristic tool, allowing me to link functional linguistics and multimodality with Gesture Studies and its taxonomies as I use them in my study. Following the discussion of methodology, Chapter 4 addressed issues regarding data collection, the participants in the study, that is, students and instructors of a massage therapy program, and the topics they discussed during my observations. I further discussed the affordances and constraints of being a single researcher, who had only one video camera to tape the classroom interactions.

Next, Chapter 5 discussed my findings, focusing on the different forms in which touch and gestures can occur, and identifying gestures in my corpus on the basis of current gesture taxonomies. Finally, I also identified gestures, which are currently not acknowledged in the taxonomy.

Chapters 6, 7, and 8 discussed my findings in depth. While Chapter 6 focused on tapping and counting gestures, Chapter 7 turned to deictic-iconic and modeling gestures. To integrate my findings, Chapter 8 offered the bigger picture, linking gesture and other modes to delivery, and embodied knowledge. To conclude these efforts, I next summarize my findings, discuss the limitations of the study, and indicate future directions this research may take.

9.2 Summary of Findings

I begin by summarizing my findings regarding tapping and counting gestures, then move on to deictic-iconic gestures, to conclude with a summary of modeling gestures.

9.2.1 Tapping and counting.

The first type of gesture I discussed was tapping. As Chapter 6 described, in their form and function, tapping gestures are very similar to beat gestures, yet they are also different in certain respects. Both appear as a rhythmic beating, most often of the hand. While beat gestures are performed mid-air, tapping gestures are created by physical contact with the own body, someone else's body, or any type of object. Beat gestures are named after their appearance, that is, they look like someone is beating musical time.

Similarly, tapping gestures appear as if someone is tapping. Because of the nature of tapping gestures, that is, the inclusion of touch into the gesture, tapping may include an audible element such as thud(s), click(s), snap(s), etc.

Just as beats, tapping provides insight into the discourse structure of the utterance as understood by the speaker who produces it. Beats and taps alike link speech elements, consisting of syllables, single words, or short phrases of two or three words, into a larger sequence. Beat and taps not only signify that the speaker considers an utterance as a unit but also distinguishes the utterance from surrounding speech.

Despite these many similarities, beat and tapping are different. As mentioned above, tapping is created through touch, and, therefore, may involve sounds (clicks, snaps, thuds, etc.), a characteristic beats cannot demonstrate because they are performed in mid-air. Furthermore, I have observed single taps, a circumstance that has not been described in the literature on beats. Single taps, often combined with an audible sound, have no temporal function in sequencing speech; however, they are similar to beats in that they emphasize a particular aspect of the speech. Often, tapping co-occurs with verbal emphasis in speech. The element of sound in speech and gesture adds to the stylistic choices a speaker can make. In addition, the temporal nature of tapping supports aspects of arrangement in delivering an utterance.

Third, tapping may also occur in form of a counting gesture. Counting, next to single taps, is yet another subtype of tapping gestures. I have named them counting gestures because they appear as if someone is counting something with his/her fingers. Although not always mirrored in verbal utterances, such as first, second, etc., counting

arranges items in speech. In other words, counting symbolizes that the speaker discusses different parts of a whole. Hereby, counting may function by offering a simple listing, manifested in quick, successive taps on consecutive fingers on the hand. If the speaker or other speakers elaborate on the information thus presented, the count may be extended into a hold. The speaker maintains the contact with the touched finger, or the hold of the hand that is participating in the count, which allows him/her to produce other gestures with the now available second hand. Such holds may be maintained over several turns between different speakers. Finally, counting not only appears in successive order but also symbolizes part to whole relationships between the topic(s) stated through speech. Depending on the situation, counting may appear as a sequence of multiple counting gestures, similar to successive taps or beats, or as a single count, similar to a single tap. A sequence of counting, just like a sequence of taps or beats, functions on the level of discourse by representing the speaker's understanding of the narrative structure and the relationship between the topic(s) discussed.

Tapping and counting incorporate the rhetorical concepts of style (tone, rhythm) and arrangement (temporal and spatial production of gestures) into delivery. In addition, counting also enters the realm of memory by relating and organizing specific fingers to specific points (implicitly or explicitly) made in speech. Through these qualities, they therefore help the representation of embodied knowledge.

Finally, I asked if beat and tapping gestures should be counted as gesture strokes or as sequences? On the one hand, it is easy to determine separate strokes and therefore separate gesture phrases; on the other hand, it may be more meaningful and significant to

account for the number of sequences instead of single gestures, especially when focusing on the meaning-making function of gestures. In the end, and following the principles of my methodology, I believe it is the researcher's decision, using an MDA heuristic, to account for the gestures as single gestures, sequences or both depending on his/her research questions.

9.2.2 Deictic-iconic.

As Chapter 7 discussed, similar to tapping gestures, deictic-iconic gestures are closely related to gestures identified in current gesture taxonomies. Throughout, deictic, as well as iconic gestures, have been extensively discussed and defined. However, this is not the case with the combination of the two types of gestures, which I call deictic-iconic.

Deictic-iconic gestures combine the characteristics of both independent deictic and iconic gestures; they have pointing qualities as well as pictorial qualities that depict seize, form, function etc. As a result, deictic-iconic gestures, when performed, transmit more information than each deictic and iconic gesture performed separately. Deictic-iconic gestures may be either performed with one hand or with both hands. When the gesture is performed with both hands, usually one hand takes the role of the deictic gesture, whereas the other one takes the role of the iconic gesture. Both gestures remain independently performed gestures. However, they acquire a meaning that goes beyond the single gesture's potential only when they are considered a unit. Those circumstances allow me to acknowledge them as deictic-iconic.

In my study, I have observed numerous matching and mismatching speech-gesture utterances. As McNeill (1992, 2005) and others argue, gestures and speech are

formed together and split only when actually produced in spoken words and gestural actions accordingly. Therefore, gestures and speech achieve a remarkable synchronicity. However, a second model by Goldin-Meadow (2005) argues that gestures and speech also may be produced in so-called mismatches. In these cases, the gestures portray a different understanding of a problem than is demonstrated by the speech. Such mismatches occur in children learners who possess different theories about the correct solution of a problem but are not yet consciously aware of them (Goldin-Meadow, 2005); they also present in teachers when instructing students (Singer, & Goldin-Meadow, 2005).

Studies concerned with student learning study gesture and speech matches and mismatches. Yet the results are not consistent. Some show that students learn from matching speech and gesture (Valenzeno, Alibali, & Klatzky, 2003), while others that students learn from mismatching speech and gesture (Singer, & Goldin-Meadow, 2005). Both studies mentioned focus on different materials taught to the students. While Valenzeno, Alibali, and Klatzky study instruction on symmetry in objects, a visual task, Singer and Goldin-Meadow study instruction on mathematical algorithms, a conceptual task. Although I cannot therefore argue conclusively that matches or mismatches support student learning in my study, these findings pose interesting questions. Do gesture-speech matches or mismatches matter, and does their efficiency in teaching depend on the topic? The issue warrants further study.

Despite those open questions, my study shows clearly that gestures, deictic-iconic gestures among them, are an essential part of human communication and the transmission

of knowledge. Through their form and function, deictic-iconic gestures support the transmission of information in a way that speech alone cannot. They provide a visual element to the utterance that cannot be found in language.

9.2.3 Modeling.

A final type of gesture I discussed in Chapter 7 is what I call modeling. Modeling gestures have not yet been accounted for in current gesture taxonomies. While they contain certain similarities to currently identified gestures, they do not fit into any of the existing categories.

The main difference between modeling and any other gesture is that they are derived from a practical action and very closely depict this action without being the action itself. That is, modeling and practical actions differ in that the former is not intended to practice the particular action. For example, in this study, when the instructor models massage techniques, she does not perform them with the purpose of massaging a student but of instructing students on how to massage clients.

Combined with accompanying speech, and other gesture types, modeling offers a window into embodied knowledge, for example, giving a massage. Modeling allows a speaker to perform an embodied practice while enriching it with speech and other gestures, thus enhancing instruction.

While speech describes the action performed, the gesture is at times interrupted. The interruptions occur in different ways. First, they may result in a hold with one hand while the other hand is free to gesture independently. Sometimes, both hands release and no hold is performed, thereby freeing both hands to gesture. These accompanying speech

and gesture sequences are related to the topic discussed but are not themselves the action modeled. As such, these utterances enhance the learners' experience by providing additional information that is not included in the modeling units. I believe that the hold performed may function as a deictic element, maintaining the connection between the speech and gesture performed past the actual modeling sequence; in so doing, it signifies that the utterance(s) is/are related to the knowledge performed in the modeling gesture.

Second, while interrupting the modeling sequence, the speaker may stay in touch through a gesture hold on the person/object associated with modeling, yet may use his/her other hand to perform a deictic, iconic, metaphoric, etc. gesture to provide further detail. These additional gestures I observed function as more in-depth explorations of a technique's specific detail, its function or the form of an underlying muscle, bone, etc. They can be described as "zooming in" on a specific detail that the speaker deems important enough to merit more exploration and explanation than modeling alone could convey.

Similar to deictic-iconic gestures, speech and gestures are not always synchronized. The mismatch in modeling gestures may result from familiarity with actual embodied practices; that knowledge functions as a memory aid of "what comes next." Gestures then occurring before speech may allow the speaker to think about how s/he wishes to describe the action performed. As discussed, two instructors mentioned to me that their actions are not random or completely spontaneous but rather planned, at least to a certain extent, with the students in mind.

Furthermore, modeling gestures are partially conventionalized. While different techniques, and therefore the modeling thereof, show slight variations between different massage therapists, a person enculturated in the culture of massage therapy will recognize a specific technique as such. For example, although different therapists may perform effleurage slightly differently, the performance will always be recognizable to someone familiar with massage as an effleurage technique.

In sum, modeling requires the presence of speech, although it may not always be synchronized with the gesture. It possesses no linguistic properties and is partially conventionalized within a particular culture. Accordingly, modeling gestures are indeed gestures and can be included in Kendon's Continuum as follows:

Gesticulation → Speech-linked gestures → Modeling → Emblems → Pantomime → Signs

Figure 9.1. Kendon's Continuum including modeling.

In this study, I have not been able to answer all the questions that arose while defining modeling gestures. For example, I must still consider how to determine the actual phases of modeling gestures. Since they are closely related to practical actions, modeling gestures are more fluid and not as clearly structured as conventional gestures. I must also determine how to count modeling gestures. Should they be counted as single gestures or as sequences? I believe the question may be answered in a fashion similar to beat and tapping gestures; depending on the research question a scholar tries to answer,

s/he can account for gesture phrases, gesture sequences, or both. According to Halliday, language functions according to its usage. I believe the same to be true for gesture; therefore, when trying to understand how gestures are used and what role they play in human communication, a researcher needs to understand how it is used by the people and consider use in his/her research accordingly—a sentiment shared by Mediated Discourse Analysis.

9.2.4 The bigger picture.

As discussed in Chapter 8, when examining a lesson on trigger point massage, gestures play a crucial role in the representation of embodied knowledge, yet they clearly cannot do the task alone; other modes and modalities, such as images, speech, textbooks, and charts, are just as important. Every mode and every modality has its own affordances and constraints. Applying Sauer's (1998) three different categories of sensory information, namely pit sense, engineering experience, and scientific knowledge. I directly observed pit sense and scientific knowledge at work in the classroom instruction. I even noticed multiple instances in which participants referred to engineering experience.

While students and instructors moved through the lesson on trigger points, knowledge was presented to students in a cyclic manner. The instruction began by focusing on textbook material, then advanced to a focus on charts and the human body; this was followed by a hands-on demonstration and practice session, before the class finally returned to a study of textbooks. To speak in Sauer's terminology, instruction moved from scientific knowledge, presented primarily through language and images in

the first textbook session; to a mixture of scientific knowledge and pit sense presented during the chart lesson, through language, images, and the human body; to pit sense offered during the hands-on session, relying primarily on speech, gesture, and the human body; to finally return to scientific knowledge which focused on language.

While gesture was present in all four parts of the cycle, it was most prominent during the parts that focused on pit sense; in fact, I observed the use of modeling at those times only. As such, gesture not only supports speech but also acquires a transitional role in representing embodied knowledge. These discoveries make a compelling case for the importance of gesture in human communication, and, therefore, of including gesture in studies of rhetorical delivery.

9.3 Limitations

As presented in Chapter 4, my data set is very narrowly focused. Specifically, I have observed students of one class participating in one specific course of the massage therapy program during the Summer and Fall semester 2009. The course is primarily taught by one instructor but other instructors substitute or demonstrate techniques of interest if required. Since students were visibly more reserved with instructors others than the primary one, someone with whom they are familiar, I used the materials videotaped with the primary instructor as my main data source; other materials presented complementary data and data for further study.

Consequently, the following limitations emerge for my data set:

- The small number of participants allows only for a limited generalization to be offered about the results.

- The selection of the corpus, that is, the inclusion of the specific students and instructors who agreed to participate, may have influenced the results in ways that another corpus would not have. I cannot conclusively determine that observed situations did not depend on individual communication styles.
- The short observation time, of less than two semesters, allowed for a limited number of situations to be observed.
- The randomly chosen time for observing the class, the middle of their educational development, may or may not have influenced my findings.
- The physical nature of massage therapy may have obscured some of the findings; as such, not all my findings may be generalizable (e.g. modeling gesture hold, length of modeling sequences).
- The data analysis had to be limited to the analysis of gesture and speech because of the nature of the study. However, participants employed more modes and modalities than I was able to analyze and discuss in-depth.
- The set up of the study, that is, my and/or the camera's presence, may have influenced participant's behavior.
- The use of one video camera only allowed limited access to the classroom as a whole. At no point was I able to record all events happening in the classroom environment simultaneously.

9.4 Future Research

My study asked the question, how is gesture used and what is its role in human communication in representing embodied knowledge? Focusing on gesture, my inquiry was guided by questions such as, how does delivery contribute to the representation of information between humans in complex environments? How do gesture and speech cooperate to represent complex information? Do current taxonomies fully account for the ways in which we currently understand the use of gesture?

As my discussion has shown, gesture is one of many modes that instructors and students use to communicate. The gestures I discussed in-depth, namely tapping, counting, deictic-iconic, and modeling, are not currently accounted for in gesture taxonomies, and co-occur with speech. The representation of embodied knowledge only comes to its fullest potential in this gesture—speech combination. For example, to understand the pictorial quality of an iconic or metaphoric gesture, speech is necessary. Similarly, gesture may contribute to arrangement and style in ways that go beyond the information directly delivered through speech alone. Therefore, when understood in terms of rhetorical delivery, gesture employs elements of style, arrangement, and memory. Furthermore, when considering gesture's role in the representation of embodied knowledge, my data suggest that modeling in particular especially mirrors the actual embodied action and, in conjunction with speech and other gestures, represents embodied knowledge.

The roles gesture play in representing embodied knowledge varies according to the type of embodied information (pit sense, engineering experience, scientific

knowledge) represented in speech and gesture and according to the type of gesture employed. For example, modeling plays a crucial role in representing pit sense, yet was not observed during instruction on scientific knowledge. However, if it is gesture, speech, or another mode that takes the leading role in representing information and knowledge, gesture always contributes to that representation of information, for example, by providing information not encoded in speech or other modes; thus the gesture highlights the arrangement of speech elements, or emphasizes the value of information stylistically.

Future research, by myself or others, should extend this investigation beyond its current dimensions. Let me identify some of these extensions. Among them, large follow-up studies could include situations with more participants and follow them over a longer period; this would improve the study's generalizability. So too could observations be extended beyond massage instruction into other areas, such as medicine, e.g. asking how do surgeons learn to operate on a person; training within industry (TWI), that is, e.g. asking how workers learn to operate machinery; and writing classrooms, e.g. asking how writers negotiate "good" writing. Furthermore, as technology becomes increasingly informed by the human body and its functions, such as movement, a study of gesture can contribute to our understanding of human-machine interaction and to understanding of ways to facilitate such interaction. For example, the field of disability studies can benefit from research on how injured humans learn to move with prosthetics, aided by motion capture technology. A broader application of technology and gesture can be found in touch computer technology, such as the use of touchscreens. As the 2010 *Horizon Report* (Johnson, Levine, Smith, & Stone) points out, in four to five years, gesture-based

computer technologies will be a regular part of classroom teaching and learning. My work on touch could help to better understand the transition to using such technologies.

Certain findings in the current study, such as the modeling hold, may belong exclusively to massage. As discussed, maintaining a hold position may be related to the nature of massage. Massage therapists are trained to stay physically in touch with a client while switching positions during a massage session. A future study could investigate if modeling occurs in embodied practices other than massage.

A follow up study could also focus on one learner from the moment s/he enters the learning environment as a beginner until s/he graduates, becomes licensed, etc., and is considered an expert. Such a study would facilitate understanding how learners use and interpret gesture in their knowledge of the field. Understanding the acquisition of such embodied knowledge by following how the novice becomes expert would not only inform this learning process but also be beneficial for understanding how gesture relates to delivery. This work would dovetail with others examining such processes in medicine (for example, Good, & Del Vecchio Good, 1993; Prentice, 2007)

As research acknowledges, humans employ more than only one mode when communicating with each other. As I have observed in this study, students and instructors used textbooks with written text, photographs, graphics, etc. They spoke and gestured. The instructor demonstrated techniques and the students practiced them in hands-on sessions. Finally, to be licensed, students needed to pass a multiple-choice test, thereby translating their embodied practice into written text. This situation is not unique to the study of massage. Because of this study's constraints, I focused on gesture. For a future

project, it would be interesting to observe how humans decide what mode to use in which situation and what work each of these modes is able to perform.

Although I have shown that gestures are used extensively in the transmission of knowledge, I cannot give specific insight into how they work. Therefore, an experimental study could shed light on questions regarding the operation of pantomime, counting or modeling as well as the functions they fulfill for speaker and audience. In respect to modeling gestures, I would like to explore their temporal make-up to determine their parts. Finally, gestures not only involve temporal but also spatial aspects. I have not been able to explore these elements in this study.

9.5 Conclusion

Despite my study's limitations, I believe I have made a compelling case that gestures are significant elements of human communication and in the transmission of embodied knowledge. As a result, I argue that rhetorical studies of delivery need to include gesture within them as more than a side note.

Indeed, my study has shown that gesture brings together diverse elements associated with the rhetorical canons. Gestures not only include elements of style and arrangement but also memory. By functioning as a unit to represent embodied knowledge, through embodied practice, gestures contribute to arguments.

Gestures are an integral part of human communication. My work has demonstrated that gestures are not only present when participants interact with an actual physical body. Gestures have pictorial qualities, such as iconic, metaphoric, deictic-iconic, or modeling gestures, which support the narrative. However, in less visually

centered situations, situations that are more text based, gestures such as beat, tapping, and counting, inform the audience at the discourse level about the topic at hand. While humans employ an increasing arsenal of technologies that help us to explore the world, and communicate with others about said world, our bodies are always central to how we experience the world and how we communicate those experiences with others. Gestures are among the modes and modalities at our disposal to communicate and as an increasing body of research shows, are crucial to human interaction.

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APPENDIX

Transcription Conventions

//word// //words// //that//	Slashes indicate words, syllables or phrases too obscure to be transcribed
[	Left-side bracket indicates where overlap talk begins
]	Right-side bracket indicates where overlap talk ends
((laughs))	Words in double parentheses indicate transcriber's comments, not transcriptions
(.)	Period within parentheses indicates micropause
(2.0)	Numbers within parentheses indicate length of pause in approximate seconds
the:re the::re	Colon indicates stretching of sounds it follows; multiple colons indicate a lengthening of the sound proportional to the number of colons.
<u>there</u>	Underlining indicates stress or emphasis proportional to the letter(s) or words underlined
THERE	Capital letters indicate increased volume
°there °	Degree marks indicate lower volume

↑there ↓there	Arrows indicate upward or downward intonation of sound they precede
. , ? !	Normal punctuation symbols indicate intonation rather than a grammatical category.
becau-	Hyphen indicates an abrupt cut-off or self-interruption of the sound in progress indicated by the preceding letter(s)
<talk>	Left and right carats (or "less than" and "more than" symbols) indicate that the talk between them was speeded up or "compressed" relative to surrounding talk
>talk<	Right and left carats (or "more than" and "less than" symbols) indicate that the talk between them was slower or "stretched" relative to surrounding talk
⌞	Hook mark indicates latching.
S1: talk⌞⌝ S2: talk	Two inverted hooks indicate latched talk by two individuals
"talk"	Quotation marks indicate impersonation of oneself or another person through voice modulation. (For example: And then he said "Don't do this"
=	Equal signs (at the end of one line and at the beginning of the next line by the same speaker, separated by the talk by another) indicate a single, through-produced utterance by the speaker separated as a transcription convenience to display

	overlapping talk by another.