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Gesture as an act of meaning-making: An eco-social perspective of a sheltered-English second grade classroom

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GESTURE AS AN ACT OF MEANING-MAKING: AN ECO-SOCIAL PERSPECTIVE

OF A SHELTERED-ENGLISH SECOND GRADE CLASSROOM

by

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ABSTRACT

**Gesture as an Act of Meaning-Making: An Eco-Social Perspective
of a Sheltered-English Second Grade Classroom**

by

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The purpose of this sociocultural study was to investigate gesture as a mediational tool for meaning-making in learning and teaching a second language. Gesture was observed between a teacher and her immigrant students in a second grade elementary classroom designed specifically for second language learners of English. This study provides an innovative investigation in the role gesture plays as a meditational tool for meaning-making by using a SCT framework at an elementary context level.

Using sociocultural theory, particularly the Vygotskian tradition, this study views gesture as a part of image in thinking. This SCT framework views second language learning in a holistic way, where language is not disembodied from making sense and is not divided in its image and speech components. The study considers gesture as an indivisible part of language, thinking, and meaning-making. In addition, gesture is viewed for its affordances for making meaning as created by both first and second language English speakers. Through the use of dialectics and dialogism, this study views gesture and speech *in-vivo* and as synthesized parts of language and necessary components to meaning-making for second language learning.

This examination of gesture illuminates how participants made meaning of the contexts and content found in their classroom. In particular, it was found that gesture plays an ubiquitous role in creating additional space and new meanings for teaching and learning a second language. Findings demonstrated evidence for gesture's use to direct attention, build inter and intrapersonal communication, and transform practices. Gesture was found to provide multiple affordances for the teacher and student, which extended the situation or interaction into new spaces of learning not readily available in just the verbal modality. The embodied learning experiences provided a foundation from which rich meanings in school tasks and classroom discourse could be shared.

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CHAPTER 1

GESTURE, MEANING-MAKING, AND EDUCATIONAL PRACTICES

Introduction

The purpose of this study was to investigate gesture as a mediational tool for making meaning in learning and teaching a second language. Gesture was observed between a teacher and her immigrant students in a second grade elementary classroom designed specifically for second language learners of English. This study was based on a sociocultural theoretical (SCT) framework, where the role of gesture was analyzed in its relation with speech and meaning-making. This study attempts to address an area of gesture through a SCT framework that has not been thoroughly examined for its use as a mediational tool for meaning-making in a second language at the elementary level.

Gesture plays a ubiquitous role as a material carrier of meaning in human communication across languages and cultures. Gesture in language is harmonic with the image, visual representational, and spatio-motoric thoughts of the mind. It is central to human cognition. Not only is gesture a central component of interlanguage communication but there is evidence to show that it is a mediational tool which affects cognition in a variety of beneficial ways (Givry & Roth, 2006; Goldin-Meadow, 2001, 2003, 2004; Lee, 2008; McNeill, 1992; Roth, 2004; Wu & Coulson, 2007). Gesture has also been found to play an important role in communication and meaning-making in second language acquisition (SLA) (Gullberg, 1998; Lazaraton, 2004; Olsher, 2004; Sime, 2006; Stam, 2006; Stam & McCafferty, 2008). It is possible that learners from differing cultures and languages share some similar strategies of gesture use in meaning-making (Sime, 2008). However, there exists very little research in the field of SLA

concerning the use of gestures and their role in making meaning in formal elementary education classroom contexts.

Previous gesture based research on children and adolescents has been performed (Antes, 1996; Church, Ayman-Nolley, & Estrade, 2004; Givry & Roth, 2006; Guidetti, 2002, 2005; Kellerman, 1992; Roth & Welzel, 2001; Stevanoni & Salmon, 2005; Thompson & Massaro, 1994). However, most of this body of work concerning gesture and children focuses on its ability to enhance memory and comprehension in first language content. With the exception of a body of work based in 10th grade science classrooms by Wolff-Michael Roth, the above research studies are not based in the classroom.

A variety of studies using differing theoretical perspectives have demonstrated gesture for its communicative dyadic functions (Adams, 1998; Gullberg, 1998; Jungheim, 1991, 2008; Lazaraton, 2004; Stam, 2006; Valenzeno, Alibali, & Klatzky, 2003); for lexical retrieval (Stam, 2001); and cognitive support (Alibali & Goldin-Meadow, 1993; Cook & Goldin-Meadow, 2006; McNeill, 1992, 2005; Singer & Goldin-Meadow, 2005). In addition, a body of work is focused on gesture and SLA in the classroom (Adams, 1998; Antes, 1996; Grant & Hennings, 1977; Kellerman, 1992; Jungheim, 2006; Mohan & Helmer, 1988). However, there is currently a lack of studies based on gesture performed *in-situ* and *in-vivo* with young children learning English as a second language in a formal classroom setting.

Using sociocultural theory, and particularly the Vygotskian tradition, this study views gesture as a part of image in thinking. The study considers gesture as an indivisible part of language, thinking, and meaning-making. According to Vygotsky (1986) children use

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concrete images instead of abstract concepts in thinking. He especially highlights the use of gesture in defining meaning of an infant's first words. His colleague, Ilyenkov (1971) viewed image, which includes gesture, as one part of a dialectic with speech, to understand thinking, activity, consciousness and meaning. Both Ilyenkov and Vygotsky addressed the importance of image, thinking, and activity as components and as a synthesized functional whole to understand language and thought. The relation of thought to language and meaning can be understood through Vygotsky's use of the term "word" as a socially constructed artifact:

> The relation of thought to word is not a thing but a process, a continual movement back and forth form thought to word and form word to thought. In that process, the relation of thought to word undergoes changes that themselves may be regarded as development in the functional sense. Thought is not merely expressed in words; it comes into existence with them (p. 218).

Vygotsky explained the formation of concepts in thinking is based on the word or any other sign, such as a gesture, as a meditational tool for focusing one's attention, selecting distinctive features, and conceptualizing a meaningful formulation of them. According to McNeill (1992) this process is both dialectic and dialogic in nature. Word, or in this case, language is made up of both speech and image which contain opposite characteristics. McNeill (2005) explains that speech contains sequential, analytic, syntactic pieces that must be combined to produce meaning; whereas, gesture, as image, contains holistic, synthetic, and analogous characteristics of meaning. These two modalities for sharing meaning can be co-expressive but are never redundant "in that each has its own means for packaging meanings" (McNeill, 2005, p. 91).

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This study draws heavily upon Vygotsky's (1924) reformulation of psychology as a socio-historic theory of mind, including his cultural-historical psychology theory (1978; 1986). This theory is based on the premise that mental activity is uniquely human and a result of social learning through the use of mediational tools. He explained that the development of higher mental functions and actions, those that are socially acquired, voluntarily controlled, and semiotically mediated in people, are mediated through the externalization and internalization of culture, social relationships, and signs. This view of meaning is not a static position in the world. In this study, meaning is viewed as a process or ongoing mental construction to understand relationships between indexes, external material, social artifacts, and internal perceptions. McNeill (2005) describes this type of meaning as "two things taken jointly, including both the point differentiated and the field of oppositions from which it is differentiated" (p. 107). In meaning-making, a perception is made about a point that stands out from the context around it but it is not a fixed correlation to a sign. Meaning-making is never static and is always in constant motion with the changing of time and space. This study's view of meaning-making differs from language acquisition models portrayed by connectionist, emergent, or computational theory, where meaning is an entity, piece of content, a relation of association, or some type of finite substance that can be transferred between participants as described in Reddy's (1979) conduit metaphor.

Gesture and Meaning-Making

This study focuses on the role of gesture as a mediational tool for meaning-making as an aspect of second language learning. Vygotsky (1978) recognized that gestures, as

signs, have a particular property of being "material carriers" of thought. In face-to-face interactions, gesture, provides a visual or imagistic representation of concrete objects and activity as well as adhering to the particulars of the cultural and social world that people construct. As an aspect of second language learning, gesture provides a foundation or grounding of meaning for new lexical and cultural content. Vygotsky addressed gesture as material carriers of meaning and understanding through his studies of young children including those attending formal education systems. These studies led him to the understanding that signs, artifacts, and activity provide potential mediational tools for learning and development. Vygotsky (1986) explained that just as physical tools are created by humans to control and change their physical environment, so symbolic and psychological artifacts, as auxiliary means, empower us to control and develop our mind and thinking. Hence, the observation of gesture demonstrates a part of a person's consciousness and meaning-making. Concerning meaning-making, Vygotsky's work is similar to Peirce's (1960) theory of signs, sharing the property that both involved mediated activity. Peirce proposed that "meaning" is a triadic relationship between a sign, an object, and an interpretent. The combination of these modes of being, are what form the process of semiosis, or meaning-making through signs. However, Vygotsky diverged from Peirce by viewing tools as externally oriented, "aimed at mastering and triumphing over nature" (p. 127). In comparison, Peirce viewed signs for mainly internalization purposes. Vygotsky emphasized both psychological and physical tools, i.e., thought, speech and gesture, as meditational signs interwoven in the activities of people's experiences.

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An examination of gesture in second language learning is essential, as speech and image are fundamental functions in language use and meaning-making for humans. An SCT framework enables this examination by viewing the opposite components of thought and language dialectically. Meaning-making becomes a focal point that describes a process from its genetic roots to future possibilities. It is through the use of psychological and physical tools as meditational means that learning and development occur in humans (Daniels, Cole, & Wertsch, 2007; Lantolf & Thorne, 2006; Wertsch, 1979/2008, 1991; Vygotsky, 1978, 1981) and gesture in language allows an examination of what and how the participants are thinking, as well as what they are saying. The focus on gesture in second language learning provides a larger understanding of communication, a clearer picture of proficiency, and evidence of development in the L2 than examining speech alone.

Vygotsky (1978) viewed gesture as an essential function in understanding child development, stating, "gesture constitutes the first representation of meaning" (p. 110). He viewed gesture as an essential meditational tool, sign, and activity in a young child's learning and developmental path in thinking and speaking. The study of gesture and particularly the study of the hand as a tool, provides an understanding of human activity and thought (McNeill, 2005; Call & Tomasello, 2007; Vygotsky, 1978, 1986). The hand as a tool provides the possibility of transforming the environment or nature, which in turn allows for human phylogenetic and ontogenetic transformation.

Research Questions

The purpose of this study is to extend the body of work on gesture as a meaning-making tool for second language learning. This is a qualitative study based on the use of gesture as an element of meaning-making between a monolingual English teacher and her English language learners in a sheltered-English elementary classroom. This study does not view meaning as residing solely in gesture and language *per se* but in the social interaction created between a monolingual English teacher and her English language learners (ELLs). The guiding questions for this study are: How does the use of gesture operate as a form of meaning making for both teacher and students in a second grade sheltered English classroom? Moreover, how does the use of gesture mediate learning of the second language?

Problem Statement / Impetus

Mainstream second language acquisition (SLA) work has continually produced research based on components of language and the process of learning it as constant, static, and measurable. A variety of studies view language with the perception that it remains stable throughout the duration of the research. This static view can be traced to the influence and interpretations of Ferdinand de Saussure's (1916/1966) analysis of language. In this viewpoint, language contains a dichotomy between what he termed *langue* and *parole*. In contemporary terms a similar distinction has been described as competence and performance (Chomsky, 1965). Saussure's two-sided view of language followed the predominant Cartesian dualistic pattern found in Western culture of his time, where the relationship between the material and spiritual, or machine-like body and

spirit-like mind was viewed as a major conflict between materialistic psychology and philosophical belief systems. Saussure put a pre-eminence on *langue*, where meaning and analysis of language was viewed as static and could "be studied in itself" (p. 16). This viewpoint provided an acceptable scientific approach to establishing linguistics as a new scientific field that could stand on its own. However, Saussure's work influenced later studies and the direction of the field towards minimizing language *in use*; hence, stymieing the analysis of performance in language. As a result, a large body of work concerning language, in and of itself, or as a subject apart from its users has been produced.

The study of second language acquisition has not been immune from this dichotomy (Firth & Wagner, 1997; Swain & Deters, 2007). Firth & Wagner called for a reconceptualization of SLA, requesting a new paradigm on how to view language learning. They argued that mainstream SLA research focused on the individual and cognition as being central to acquisition. Firth and Wagner identified multiple challenges facing mainstream SLA concerning communication and discourse such as the native-speaker (NS) being placed as "the warranted baseline from which [non-native speaker] NNS data can be compared, and the benchmark from which judgments of appropriateness, markedness, and so forth, can be made" (p.183). Ten years later, Swain & Deters also found this to be the norm for SLA studies. They explained that although SLA research has grown in diversity, the majority of mainstream SLA studies continue to use traditional methodological research approaches that are quantifiable and experimental. This standardized or norm-based approach to viewing language often reinforces NS and NNS relational discrepancies.

A SCT Alternative Approach to Learning and Language

A Vygotskian approach to learning or understanding higher psychological processes is based on the premise that the social environment's role in the development of mental processes, is linked to the affordances of the meditational tools available to people's minds. Vygotsky (1997b) viewed tools or artifacts, such as gestures, as an embodiment of thinking in a materialized form. For him, both gesture and speech in language were viewed as material carriers that embodied meaning. In addition, the actual kinetic motion found in gesture, similar to writing for speech, was viewed as a form of thinking. For Vygotsky, language was understood as a dialectic association between speech and image; neither was a cause for the other but both made up a unity in thinking. McNeill (1992) termed this dialectical unity between speech and gesture, as image, as the "growth point" (p.219) of thought. Following a Vygotskian perspective, McNeill explained that the observation of gesture demonstrates a part of a person's thought processes.

Vygotsky's and McNeill's views of learning and communication are dissimilar to mainstream educational practices for learning. Whereas cognitive and computational second language theories and models in education reduce language to linguistic components that can be socially shared as a commodity, Vygotsky's work was centered on individuals and the meditational means and processes by which language is learned. He explained that the natural form of thinking and the development of a concept were not formed from a simple transfer or repetition of traits or facts but through a complex modification of the trait during the process of its use (Vygotsky, 1987d). This theory stands in contrast to mainstream educational procedures and assessments that focus on the dissemination and location of correct answers. In contrast to Vygotsky's work, this

systematic task endeavor for the "correct answer" does little to identify and invite a person's personal thoughts, feelings, and background into the process. This develops a dualistic approach to learning, where a learner's volition and intrapersonal voice is secondary or often severed to obtain the model or system's "pre-selected" or "choice" answer. Although gesture plays a pervasive part of language learning and thought processes, a large body of work views its role in education as para-linguistic and as a cue to helping a teacher or learner to communicate. Very little literature is dedicated specifically to elementary and secondary education teachers concerning gesture's role as a fully integrated part of speaking and thinking. In contrast, Vygotsky's dialectical view between gesture and speech coincides with Saussure's parole where gesture does not just accompany speech but provides the person possible affordances of meanings that change and are influenced by both space and time of the context around them. In this framework, meaning is not found as a resident within the sign, but is found through the process of being and acting in the world. Scollon (2004) emphasizes that language is not something that comes in "nicely packaged units" but is a "complex and kaleidoscopic phenomenon" (p. 272). An embodied educational experience, including the consideration of language as a means of thought, identity, voice, and consciousness in society, is described by van Lier (2004) as *ecological education*.

Ecological Education and a SCT Approach to Teaching and Learning

The etymology of the English word "ecology" is taken from the Greek *oikos*, meaning house, the immediate environment of humans. German zoologist Ernst Haeckel (1866) provided the broader definition as the study of the natural environment and the relations of organisms to each other and to their surroundings. Educational ecology

parallels a biologic model in that understanding of processes of the classroom community, the social arrangements, physical artifacts, historical backgrounds, and their relationship to each other are all a part of the learning system. All parts of the classroom ecology are potential affordances, which offer opportunities for learning and development. Education is a socially constructed system supposedly made as a way to manage the resources of a culture and perpetuate or improve the quality of life desired by its members (Bruner, 1996). At the heart of this eco-social system is language, a semiotically constructed system, which carries meaning to its members. Language is the driving force in all educational subjects and content. Management of language as the central resource of an educational eco-social system is of utmost importance to everyone's meaning-making of the world around them. In biological ecology, many rapid changes in the environment in the name of improving the quality of human life, causes an increased strain on the earth's ecological support systems. E.O. Wilson (1988) explained that any reduction in biodiversity can upset the balance of a system and alter its function. Similarly, any reduction on language in an educational eco-social system can stymie the learning and developmental abilities of humans. Second language learning (SLL) is of particular interest to this problem because its primary focus is on the use, learning, and management of another linguistic and cultural system. As language challenges arise between participants of different languages and cultures, a type of reductionism in communication often develops to facilitate some type of common ground from which both parties can make meaning. Colloquial terminology for this reductionism in SLA has been *negotiation of meaning* and *comprehensible input*. In mainstream educational classrooms, reductionism of language takes such forms as Universal Design,

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and any number of prescribed or scripted programs. Particular to second language issues, lists and models of how to reduce the complexities of language into manageable and sharable discourse units have inundated the field of education (Wooldridge, 2001). These models and protocols are based on a synchronic approach to language where form-content relationships remain constant across time and space. The speakers themselves and their social-cultural backgrounds are also implicated in this paradigm as constants in the world. As a result, the primary concern in many second language-teaching models is the dissemination of linguistic components in a lesson. The reducible effect of meaning-making caused by prescribed models is often unnoticed in the field of education because of a program's labels or advertisement for dynamic social interaction and grammar teaching activities leading to ELL higher scores.

From an SCT perspective, an ecological approach to second language learning is based on the learning of language as relations of identity, activity, position, and power in the culture rather than as objects such as words, sentences, and rules to be mastered (van Lier, 2000). An ecological approach not only addresses language's use in explaining subjects, content, and activities but it also provides the learner a source of identity and consciousness (Pavlenko & Lantolf, 2000; Peltier & McCafferty, 2010; van Lier, 1996). van Lier (2004) explained:

Language is part of other message systems that are tied up with all our sensory systems, and all our memories and all the stories we construct to strengthen and nurture our identity. It is not possible to sever language form all those ties and yet have education make sense (p.1)

A reduction of language by many models and programs prescribed for educational systems relies on the theory that linguistic components can be reduced to a single substance. To achieve a simplistic and measurable solution to what is deemed a complex situation, many educational and language-learning practices bypass and discount identity and voice issues for formulaic and static linguistic practices.

Although not specific to L2 learning, a Bakhtinian (1981) theoretical approach to language learning complements a Vygotskian view of meaning-making by highlighting the complexity of activity in ecological learning and development perspective of humans. Bakhtin addressed language, identity, and consciousness in the term "utterance" as having multiple backgrounds and being double-voiced. He recognized the voices of others coupled with one's own as heteroglossic dialogue, which provides a thought, idea, or utterance, some type of shape, life, and meaning. In this "dialogism", there is no finite answer or voice, but instead multiple voices working simultaneously together that continue to both define the individual and build an historic background of context for society. Dialogism in education supports Vygotsky's (1986) theory of ecological learning, where the appropriation and internalization of dialogue can be used as a mediational tool for psychological development.

Classrooms in the U.S. are more diverse today than ever before in history. This diverse population brings many linguistic and cultural identities with an array of student and teacher voices in the classroom. For Bakhtin (1981), discourse and thought are always in the process of becoming, and development often occurs through "tension-filled interaction" (p.279). Diversity and multiple first languages (L1s) in the classroom can be a cause of tension but in this tension or "contact zone" students and teachers have the

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opportunity to develop and grow. Through Vygotsky's dialectic and Bakhtin's dialogic

work, educators can recognize the important role that heteroglossia plays in

understanding both the multiple-voices and contradictory voices in the classroom.

Sperling (2004) recommended the incorporation of Bakhtinian contradictory theory in

literacy pedagogy and the classroom as a whole. It allows teachers to portray real world

context from which voices are embedded. She explained that language is not just a

symbolic system that needs to be linguistically decoded but that it is also a carrier of

cultural metaphors and meanings. There are pragmatic language skills that are essential in

all languages for developing relationships with others and communicating in a variety of

contexts such as the school classroom. Messages that teachers or students send may in

fact contain pragmatic meanings, or culturally embedded conceptual metaphors, which

meanings are not apparent through interpretation of only the formal linguistic study of

language. "Meaning making involves situating encounters with the world in their

appropriate cultural contexts in order to know 'what they are about'" (Bruner, 1996, p. 3).

As noted by Putney, Green, Dixon, Duran and Yeager (2000), "individuals are not

socialized to the culture of the collective. Rather, members of a group construct cultural

tools and practices through joint activity, and individuals learn the means of constructing

knowledge as they engage in joint activity. Thus, they are transforming the developing

culture as they take up and transform the resources of that culture for themselves" (p.

104). This stands in contrast to many mainstream education systems, which promote

information processing, institutionalized monologic voice, limited authentic participation,

and value memorized material and conformity of thought over approaches that lead to

self-regulation and development of the trait.

An SCT eco-social perspective of education, proposes an alternative, dialogic/simultaneous voices approach. In this process, a teacher is more concerned with participation and where the engaging discourse takes them, rather than the evaluation of right and wrong. In a dialogic based educational approach, acceptance and encouragement of multiple voices tends to increase confidence, stimulate memory, promote higher thinking, and encourage individual expression and style in the students. As a result, students in an open-discourse, multi-voiced format have the opportunity to progress towards self-regulation (van Lier, 1996). In addition, teaching becomes "a dynamic process through which the teacher learns from observing what students take up, and in turn, uses this knowledge to formulate and reformulate classroom activity" (Putney & Broughton, 2010, p. 9).

This study uses a SCT and ecological perspective to understand the role of gesture in second language learning in education. Its purpose is to view second language learning in a holistic way, where language is not disembodied from making sense and is not divided in its image and speech components. In addition, gesture is viewed for its affordances for making meaning as created by both native and non-native English speakers. Through the use of dialectics and dialogism, this study views gesture and speech as synthesized parts of language and necessary components to meaning-making for second language learning. In contrast to many communicative models where native speakers have held the position of language expert, in this study gesture use was viewed in its development *in vivo* and how it added meaning in the ecology of the classroom.

Organization of Dissertation

    This dissertation has been divided into seven chapters. Chapter one, the introduction, includes general background of the study, the research questions, an overview of the theoretical framework, and impetus for how gesture is viewed in second language learning. Chapter two provides a review of historically seminal and contemporary literature of SCT. Specific sections in this chapter are addressed in the overview. All sections make reference or provide examples of learning and development both inside and outside of formal classroom educational settings. Where applicable, second language learning (SLL) concerns are discussed throughout each section. Chapter three provides a literature review of gesture as a mediational tool for general cognitive development and role in SLL. Again, chapter sections are provided in the overview section. Chapter four contains the methodology of the study. This chapter articulates how the previous chapters' information was implemented in the construction of the study. Topics in this chapter include the method of study; the perspective and design; the participants; the setting; the researcher's role; and the procedures of analysis. Chapter five contains the findings for the data. Chapter six provides an analysis of the findings. Chapter seven presents the conclusions and implications. This dissertation deals with applied linguistics issues and follows the field's mode for using sources from multiple academic fields. Articles reviewed and statements made are drawn from a variety of areas concerning SLA, SCT, gesture, and meaning-making.

CHAPTER 2

SOCIOCULTURAL THEORY AND LANGUAGE

Sociocultural Theory (SCT) Overview

Sociocultural theory is based on the central idea that learning is socially situated and that the human mind is mediated through activity with physical and psychological signs. This framework is not about the social, the cultural or the historical aspects of a person's experience individually but about the mediational use of these aspects as tools for developing higher psychological functions. Vygotsky (1978) stated that people do not act directly on the world but rely instead on artifacts, activities, or other mediational tools, such as signs, to change the world around them. "Mediation is the means by which newer forms of higher order development occur" (Robbins, 2001, p. 26). In this sense, perception of or immediate attention to a tool or sign does not necessarily extend a person's understanding and thinking beyond the associative level of the object, artifact or activity. Instead, a mediational use and interaction with the artifact provides the possibility for higher psychological functions.

In SCT, human social and mental activity is organized through artifacts. These tools or artifacts can be physical, symbolic, or psychological. Vygotsky (1981) explained the use of artifacts as functions in a child's development:

Any function in a child's cultural development appears twice, or on two planes. First it appears on the social plane, and then on the psychological plane. First it appears between people as an interpsychological category, and then within the child as an intrapsychological category. This is equally true with regard to voluntary attention, logical memory, the formation of concepts, and the development of volition… It goes

without saying that internalization transforms the process itself and changes its structure and functions. Social relations or relations among people genetically underlie all higher functions and their relationships (p. 163).

SCT views the development of culture, social relations, and identity formation as a social, dialogical process occurring through a person's activity within the context of social interaction (Daniels, Cole, & Wertsch, 2007). One way that this typically occurs is through the expert-novice relationship or commonly viewed as adult-child interactions. Lantolf (2000) explains that as novices learn from experts through imitation, in contexts in which they are viewed as communicative beings, the novice creates a new way or a new understanding that leads to transformation. In this case, imitation is a combination of the ability of the novice to mimic the expert to some extent and to bring in his or her own identity or voice which transforms the activity, artifact, and/or the participants themselves. In an SCT perspective, identity development is co-authored. It includes self-authoring volition, often expressed as inner-voice developed as an incorporation of external voices, to assist the person in gaining a better understanding and standing with specific communities or audiences.

This chapter focuses on sociocultural theory and its relationship to first and second language learning. SCT topics are discussed in the following sections, (1) Historic basis of cultural-historic and activity; (2) Transformation and Internalization; (3) Zone of Proximal Development. A shift from general SCT to its perspective regarding language occurs in the fourth and fifth sections, (4) SCT, Thinking, and Speech for Children and (5) SCT and Second Language Learning (SLL). The last section of this chapter, (6) Pedagogical Implications, extends the relation of SCT and SLL to the classroom setting.

It should be noted that in these sections a strong distinction between second language *learning* and second language *acquisition* (SLA) is not debated. SLA as a term has historically referred to people who are fluent in their first language (L1) and are acquiring a second language, typically excluding the bilingual child in this terminology. The debate of whether language is acquired, or can be taught and learned through overt practices is not addressed in this study. As a result, SLA is referred to for its historic use in mainstream research, but it is also displayed as a subordinate category of second language learning in general.

Historic Basis of the Cultural-Historic and Activity Based Approach to SCT

Revolutionary Russian psychologists formulated the historic basis for SCT in the 1920s and 1930s. Lev Vygotsky developed the basic concept with contributions from A.R. Luria and A.N. Leontiev. Based on Marxist (Marx, 1845/1967) philosophy, Vygotsky's (1924) cultural-historical approach provided a new theory to understanding human development and transformation. Vygotsky and his colleagues formulated a new, non-traditional cultural-historical psychology based on the concept of artifact mediation and object centered action to understand the phylogenesis and ontogenesis of humans. In general, the basic principles of SCT are often traced back to Vygotsky's and Bakhtin's dialectic and dialogic theories and include characteristics such as object-orientedness, internalization and externalization, tool mediation, transformation and development.

Vygotsky (1924) developed cultural-historical psychology as an alternative to existing psychologies based on a Cartesian dualistic approach to understanding the mind and the world. At this time, Vygotsky saw Descartes' (1649/1989) dualism as pervasive

throughout most of the sciences of psychology. For many centuries philosophers such as Socrates and Plato viewed the relationship between the material and spiritual or machine-like body and spirit-like mind as conflicting entities. Descartes viewed the mind as a nonphysical substance where consciousness resided. He made a clear distinction that the brain was the seat of intelligence differing from the mind. One problem arising from Cartesian thinking was the inexplicable way a nonphysical or material substance such as consciousness could influence the physical based body and world.

Vygotsky used Spinoza's (1675/1979) philosophy of monism and philosophically based Marxist psychology to address the dualistic crisis of dividing individual consciousness from the physical world in traditional psychologies. Vygotsky (1924) explained that scientific psychology's dichotomy between the physical world, including its content and internal behavior, could not explain the facts of conscious behavior. Vygotsky's (1986) work, based on Marxist & Hegelian dialectics, described how the dualism found in psychology's behaviorism and gestalt approaches could be overcome. He proposed that these two opposite views of the human psyche could be understood when analyzed as a whole and complete unit through a genetic viewpoint. Vygotsky (1978) explained this stance, stating:

> The cardinal distinction between the mode of action of a thinking body and that of any other body, quite clearly noted by Descartes and the Cartesians, but not understood by them, is that the former actively builds (constructs) the shape (trajectory) of its own movement in space in conformity with the shape (configuration and position) *of the other body,* co-ordinating the shape of its own movement (its own activity) with the shape of the other body, *whatever it is"* (p. 46).

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Vygotsky (1986) used this dialectic relationship in understanding language and thinking. He viewed language as dynamic with unstable parts that could only be understood through a dialectical holistic concept. In Vygotskian SCT, learning and development is about meaning, with language placed at the forefront and identified as a part of thinking. Vygotsky (1986) explained:

Meaning is an act of thought in the full sense of the term. But at the same time, meaning is an inalienable part of word as such, and thus it belongs in the realm of language as much as in the realm of thought (p.6).

Humans as meaning-makers are positioned as beings with volition and agency, which produce and are influenced by signs. Language and thinking are related through meaning. In an SCT perspective, the act of interpersonal communication through language is also a partial demonstration of intrapersonal thought. Interpersonal language is a tangible artifact on the physical plane, which can promote and develop a learner's understanding of complex concepts.

In Vygotsky's cultural-historic psychology, the mind, including consciousness, is not ontologically separate from the physical world. Instead, he theorized that the development of higher mental functions and actions in humans is mediated through the externalization and internalization of cultural artifacts, social relationships, and signs. An SCT framework views the mediational use of psychological and physical tools as the key to learning and development in humans (Daniels, Cole, & Wertsch, 2007; Lantolf, 2000; Lantolf & Thorne, 2006; Wertsch, 1991; Vygotsky, 1978, 1981, 1987a).

Transformation and Internalization

Vygotsky (1981) described that learning proceeds development and that through a long series of developmental events, the appropriation of an external process into an internal one occurs. Vygotsky viewed material carriers or semiotic signs in the physical world as having a two-sided nature as a result of signs having tangible, objective forms in the material world and subjective meaning and sense in the mental world of the individual. Vygotsky (1978) termed *internalization* as "the internal reconstruction of an external operation" (p. 56). For him, internalization was not a transmission process that duplicates the external model. Instead, it is a process that fuses both the idealized form of the sign in the social world with its subjective sense by the individual (Lantolf & Thorne, 2006). Gal'perin (1992), one of Vygotsky's students, elaborated on this concept explaining that mental processes are parallel to material activity - they are similar, but not identical. Arievitch & Haenen (2005) building on Galperin's work, described:

Actions performed in abstraction from the physical situation, although termed "mental actions," are, in Galperin's interpretation, not internal, mental faculties, nor are they a reflection of brain processes. They are object-related actions, as are all other human actions, the only difference being that mental actions are carried out in a special form; that is, without physical execution. Conceptualizing mental activity itself as an object-related activity implies that it occurs in the objective, outer world. It is carried out not according to any internal "mental" laws but rather according to the laws of the external world; that is, in compliance with particular characteristics of external objects and processes. Therefore, in Galperin's view, mental actions have the same object-related content as the material actions in a corresponding field (p. 158).

The relationship between the mental and physical activity is bi-directional (Valsiner, 1997). In an SCT framework both planes are understood to be dialectically related which come together in learning and development.

Internalization of activity and transformation of consciousness can be understood as a dialectic and dialogic interaction between the inter- and intra-psychological planes. It is dialectic in that two oppositely positioned processes come together in a cyclical relationship that provides meaning as a unified whole. It is dialogic in that genetically established signs and activities come together in the present context, providing new meanings and the possibility for development. It is the dialectic relationship between the social and intra-personal activity that establishes the possibility for the interpersonal function to become internalized knowledge leading to self-regulation.

Vygotsky (1987a) specifically addressed *word,* as the minimal unit of study that most readily demonstrated the basic unit of study for thought and language, cognition and consciousness. Robbins (2001) explained Vygotsky's use of *word* as a context embedded sign that mediates social and individual activity. She argued that *word* is viewed in the original Russian translation metaphorically with a connotation of "word meaning" in context, almost an opposite to an English interpretation of *word* as a single unit, alone, without context (p. 45). For Vygotsky, the *word* encompassed the elements found in thinking and speech. He described that the word or utterance as speech was not the externalization of a completed internal thought, but explained that speech and thought are dialectically intertwined and come together to produce the word. Thus thinking is completed in the word and the word is completed in thinking. Vygotsky (1997a) explained that the relationship of thought to word is a vital process that involves the birth

of thought in the word. Deprived of thought there is no word. The connection between thought and word is not a primal connection that is given once and forever. It arises in development and itself develops. The importance of the "thought to word" process is the development of meaning and sense. "Meaning is the path from the thought to the word" (Vygotsky, 1987c, p. 133). Vygotsky did not view meaning as a quantitative sum of all psychological operations that stand behind the word, but as an individual understanding of the semiotic sign's operation in the social.

In SCT, development emerges through social activity when the individual is ready to absorb a new concept. Signs are transformed as they are encountered and incorporated in relation to an individual's past experiences. Vygotsky (1986) explained that meanings of words or signs are not static but are understood through a dynamic process where present context and past experience merge. He stated:

> The relation of thought to word then is not a static thing but a process, a continual movement back and forth from thought to word and from word to thought. In that process, the relation of thought to word undergoes changes that themselves may be regarded as development in the functional sense. Thought is not merely expressed in words; it comes into existence through them (Vygotsky, 1986, p. 218).

Development, through the word or other mediational tools, can lead to transformation in the individual and society. Valsiner (1997) describes this concept in detail, stating:

> Internalization is a negotiated process of development that is co-constructed through constant forward-oriented construction of signs that bring over from the extrapersonal (social) world of the person to the intrapersonal subjective world semiotically encoded experiences, which, as personal sense systems, guide the person's process of

further reorganization of person-environment relationships. Through this process of

externalization, immediate person-environment relationships are constantly being

reorganized. Some aspects of this reorganization may carry forward to contribute to

future reorganization as feed-forward cultural regulating means. At least for humans,

this process always is socially mediated whether or not other persons are physically

present (p. 246).

An SCT approach to learning and development uses a present to future reference point.

For Vygotsky (1978), the appropriation and regulation of signs were best viewed in what

he termed "The Zone of Proximal Development" (p.86).

Zone of Proximal Development (ZPD)

The term ZPD is used to describe the concept where human psychological learning is

made apparent through activity or basically through the process of using material tools,

which can be socially viewed. For Vygotsky, education or learning is understood to be a

psychological process of development that is fundamentally accomplished through

human activity, which is also a theory of psychological development (Moll, 1990).

Vygotsky's work established the basis of socio-cultural theory in education by explaining

how the essential characteristic of instruction is based on the introduction of conscious

awareness in many domains through the manipulation of tools of thinking (Bruner, 1986;

Vygotsky, 1987).

The ZPD is defined as the difference between the levels of development already

obtained by an individual and the proximal next stage that is visible in conjunction with

assistance and participation within a collaborative activity. Vygotsky (1978) specifically

defined the ZPD as:

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... the distance between the actual developmental level as determined by independent

problem solving and the level of potential development as determined through

problem solving under adult guidance or in collaboration with more capable peers"

(p. 86).

His unit of study is based on the central concept that human activity and human

growth is related through the material existence of signs and tools. Following a Marxist

viewpoint, Vygotsky's ZPD demonstrated a perceptible and tangible process for learning

and development, where conditions can be observed and tools or signs can be physically

constructed and applied between participants. As described earlier, the social or material

plane plays a central role in not only acquiring knowledge but in moving from learning to

development. From the social plane, a person is then able to bring knowledge into the

intra-psychological plane. However, this is not a one-way transmission model. Learning

does not occur in a single linear or transfer fashion, from the outside in, but occurs as a

person moves knowledge from the intra-psychological plane, back out into the social,

material, or inter-psychological plane.

In Vygotsky's Zone of Proximal Development (ZPD), the more capable other and the

learner interact in a constructive manner where transformation of the expert's knowledge

goes beyond mere mimicking by the novice, to actual imitation. For Vygotsky, imitation

in conjunction with instruction was a crucial component of how children learn and

develop beyond just repeating a task but actually interacting, communicating, and

employing the concept or task beyond the initiating example. Vygotsky (1986) described

the relationship of imitation and development in the ZPD:

imitation and instruction play a major role. They bring out the specifically human

qualities of the mind and lead the child to new developmental levels. In learning to

speak, as in learning school subjects, imitation is indispensable. What the child can do

in cooperation today he can do alone tomorrow. Therefore, the only good kind of

instruction is that which marches ahead of development and leads it; it must be aimed

not so much at the ripe as at the ripening functions (p. 188).

An inclusion of imitation to learning and development in an educational perspective

brings a transformational idea to learning and development. Ellis and Barkhuizen (2005)

elaborate on this concept stating, "The genetically endowed capacities with which we are

born are modified and reorganized into higher order forms, which allow individuals to

exercise conscious control over such mental activities as attention, planning and problem-

solving" (p. 230). In this light, the actual process of learning and development is

performed between the learner and the social tool. Vygotsky (1978) described that by

appropriating the resources or tools of a culture through activity, such as imitation, the

individual transforms both the tools and themselves in the process. For Vygotsky this

internalization was not just a duplication of the external form but that the process was

transformative (Vygotsky, 1987a). This is not a linear or hierarchical model but a

dynamic situation where knowledge from historic artifacts dialogically merge with

current associative knowledge to create a higher mental conception. Thus, the ZPD was

treated as both a diagnostic tool and theoretical concept for understanding the

transformation and development processes of humans. The features of the ZPD can be

understood as working dialectically and dialogically "when the child is interacting with

people in his environment and in cooperation with his peers. Once these processes are

internalized, they become part of the child's independent developmental achievement (Vygotsky 1978, p. 90). In this aspect of Vygotsky's thinking, the externalization and internalization of mediated tools including their genetic roots, merge together to produce higher mental functions.

SCT, Thinking, and Speech for Children

First Language Speaking and Thinking for Children

Vygotsky (1986) viewed the conception of word meaning as "a unit of both generalizing thought and social interchange" (p. 9). He viewed language and thought as interrelated with the growth of the child's thinking ability being tied to their social and biological development. Piaget (1959) explained that the adult's thinking is different than a child's. Piaget viewed the adult as a social thinker with the capability of addressing both individualistic and social psychological stances reflectively and symbolically. Contrarily, he viewed children's thinking and speech as being mostly monologue and individualistic "because the child does not attempt to place himself at the point of view of his hearer" (p. 9). For Piaget, a critical point in the transition between child's and adult's thinking was egocentric speech, which he described as children vocally speak to themselves. Piaget viewed egocentric speaking and thinking as being the special link in development between the autistic or individual centered thinking of a child and the social thinking of an adult. Piaget (1969) described the movement of a child's thought from practical activity that was imagistically based to a more social attitude that includes reflection and logical unification of ideas. He explained that the first critical stage for this development occurs previous to the age of seven or eight. In addition, Piaget viewed

egocentric speech as only a transition step in development and disappeared with the increase in the adult social stage.

Addressing Piaget's (1959) developmental categorization of children and speech, Vygotsky (1986) differed in interpretation of what Piaget labeled "egocentric" thinking and talk. For Vygotsky, both the communicative and the egocentric speech are both social but with differing functions. In this intertwined relationship, language acquisition is a symbolic artifact that is used to regulate interaction as well as personal mental processes. He explained, "Egocentric speech emerges when the child transfers social, collaborative forms of behavior to the sphere of inner-personal psychic functions" (p. 35). In this case, the pioneering point Vygotsky makes concerning egocentric speech is its internalization into inner-speech, and that the starting point of development of a child's speech and thought begins on the social plane. He stated, "the true direction of the development of thinking is not from the individual to the social, but from the social to the individual" (p. 36). In Vygotsky's interpretation of child development, egocentric speech is a visible artifact that can be used mediationally for overcoming cognitive challenges. In addition, the use of egocentric speech is not a momentary transition of thinking and speaking that disappears in adults but internalizes and is a physical manifestation of inner-speech and thinking. This process can occur both consciously and unconsciously in both children and adults but always begins on the social plane. As a result of this perspective, Vygotsky claimed that learning proceeded development, a strong departure from Piaget's notion that development led learning.

Vygotsky (1987a) approached learning and development, including both native and foreign language acquisition through the dialectical synthesis of the spontaneous and

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scientific concepts for the child. Following this approach, Vygotsky viewed development of the student in a process where the scientific and spontaneous concepts come together but through different ways. He described, "the development of scientific and spontaneous concepts take opposite paths" (p. 217). The spontaneous concepts begin in the child's life in a process that is unconscious. Thus the child gains knowledge of objects, verbal formulation, and volitional use of them in developing complex logical relationships without consciousness of the larger concepts behind these tools and symbols. The child is consciously aware of the object or words but is not consciously aware of the concept itself. In this case, "the child gains conscious awareness of spontaneous concepts at a comparatively late point in the developmental process" (Vygotsky, 1987, p. 217).

In contrast to spontaneous concepts, scientific concepts are consciously acquired and often fill in the areas of knowledge that were underdeveloped through the spontaneous learning experience. In the school age child, scientific concepts are consciously learned with lessons designed to consciously work on a specific concept. In this case, consciousness of the concept is brought to the forefront and application and analysis of the concept is practiced with the hope that it becomes spontaneous. Vygotsky (1987) described that both the spontaneous and scientific concepts work towards each other similar to two lines moving in opposite directions. One line moves from above to below and the other rises from below to above. He stated:

> the child's spontaneous concepts develop from below to above, from the more elementary and lower characteristics to the higher, while his scientific concepts develop from above to below, from the more complex and higher characteristics to the more elementary (p. 219).

Both concepts work together in the child. One cannot separate the concepts acquired by the child whether at home or at school. Although spontaneous and scientific concepts have differing genetic points, both are influenced by each other and are "internally and profoundly connected with one another" (Vygotsky, 1987, p. 219). Scientific concepts are consciously identified and studied with volition, but are not necessarily spontaneous or situationally meaningful, and do not typically originate from the child's personal experience. In contrast, spontaneous concepts begin in the domain of the concrete, meaningful, and personal history of the child. The movement and coming together of these two developmental processes is "the link of the zone of proximal and actual development" (p. 220). Vygotsky described the ZPD as the combination of conscious awareness including the volitional use of scientific concepts, in conjunction with the child's spontaneous concepts, which were underdeveloped until they emerged or became actual in collaboration with adults or the more capable other. He stated, "The link between these two lines of development reflects their true nature. This is the link of the zone of proximal and actual development" (p. 220). The reorganization and raised awareness of a child's spontaneous awareness forms a ZPD. A result of the dialectical tension and synthesis of spontaneous and scientific concepts in the ZPD eventually results in what Vygotsky states, "what the child is able to do in the collaboration today, he will be able to do independently tomorrow" (p. 220).

Children's Language Learning

In SCT signs, as semiosis, are viewed as mediational tools for learning both a first and second language. Following Vygotskian principles, SLA requires social interaction, typically with a more capable interlocutor to develop higher mental functions in the

second language. Social interchange is paramount to a learner's ability to make meaning of the signs around them to obtain self-regulation in a variety of contexts in their second language. Playing a strong role as a sign for mediation for both adults and children, external speech provides a physical activity that can be viewed, analyzed, and modified between the novice and more experienced interlocutor. For adults, speech may be the predominant form of semiotic mediation in making meaning in language. According to Lantolf & Thorne (2006) adults' first-language system is "their primary symbolic artifact for regulating their own cognitive activity" (p. 295). However, ontogenesis of the individual may first begin with the embodied experience of the world. Gibson (1979) explained that people, without physical impairments from birth, understand the world and activities through their perception and perspective of the ecology around them. The physical world, horizon, artifacts and symbols around a person may provide the foundation or "grounding" from which meaning is made, and this grounding may play a more heightened role in meaning-making for children. Children may come to a similar understanding of a words meaning as an adult, but through a different way. Vygotsky (1986) described children's understanding of a word's meaning as being more strongly attached to physical objects. He described that the transferring of meaning between words occurs through a mixture of two forms, "the associative complex and the syncretic image" (p. 126). Following Vygotsky's hypothesis of children's language, it is possible that children's use of syncretic image or heap of objects in language is relied upon and manifested more than in adults when making meaning. Children lack the conscious knowledge of the symbolic conceptual nature of their language in comparison to adults. Children rely on associative complex concepts and syncretic images as mediational

means to making meaning but do not produce the same abstract mental conceptions found in adults. Vygotsky explained:

> For now, let us say only that the use of general words does not yet in any way presuppose an equally early mastery of abstract thinking because, as we have already demonstrated through the present chapter, a child uses the same words as the adult and applies these words to the same range of objects, but nevertheless thinks about that object totally differently, in an unrelated manner, to that of an adult. Therefore when, at a very early age, a child applies these words, which in adult speech signify abstract thinking in its most theoretical forms, they do not by any means, signify the same thing in the child's thinking (Van der Veer & Valsiner, 1994, p. 256).

Although there are cognitive and conceptual differences between adults and children, word meanings may still refer to the same object, providing both participants shared intentionality. Joint-attention and shared intentionality between participants provides a shared meaning; however, the child thinks or learns about the word or object in a different way by different mental operations (Vygotsky, 1986). The associations of words applied to differing objects rely on the criterial attribute and context of the object or subject. Assimilation of characteristics with their like parts and ideas results in a general idea about the specific attribute; eventually a synthesis of attributes leads to a general concept or idea coming into being. In this case, children and adults work together to make "sense". However, the child is more interested and focused on the meaning-making part of sense, not on the dynamic, unstable, and fluid characterisitics of the object or word. According to Vygotsky, the sense [*smysl*] of a word, "is the sum of all the psychological events aroused in our consiousness by the word" (p.244). In second

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language learning, children often bring meanings [*znachenie*] of the world and of words considered stable from their L1 culture and try and develop these meanings through a second language or word. The sense or *smysl* of a word "changes in different minds and situations and is almost unlimited" (p. 245). In teaching a second language, meaning is often limited and narrowed by the context of the lesson. In addition, many institutionalized education programs for L2 learning, meaning is often based on the addition of linear lines of learning syntactic, lexical, and phonological components of a language. For children, a grounding or deep understanding of the context for the meaning of these language components may be at the forefront of learning and development. Vygotsky stated, "The only difference between the thinking of a child and that of an adolescent, is that what we as adults understand to be objectively immaterial, circumstantial and superficial, children interpret as essential qualities" (Van der Veer & Valsiner, 1994, p. 189). These qualities may be consciously observed or unconsciously assumed by adults but play a foundational role in the development of higher conceptual thinking. Vygotsky described the process of thinking in complexities for children as the fountainhead of conceptual development. His research showed that the development of any higher form of intellectual activity is "not a simple product of a quantitative transformation of lower forms" (Vygotsky, 1987a, p. 133). Transformation and development is not about the process of connecting associative elements. Instead, transformation is about a process that is fundamentally new and qualitatively irreducible. Vygotsky explained that development was based on "the transition from unmediated intellectual processes to operations that are mediated by signs" (p. 133).

SCT and Second Language Learning

SCT and SLA

In an SCT approach to second language learning a students' past and present activity, environment, and knowledge are given value and considered a part of the learning experience. van Lier (1996) describes this approach to second language learning as "an *ecological* approach, in which interactional contexts offer or provide affordances that the learner or child may perceive and act on" (p. 53). In this learning approach, special consideration should be given for a student's background and the context for learning and using the second language. An ecological environment to learning includes any material, such as other people's voices, artifacts, physical tools, and psychological tools such as symbols and metaphors, within a learner's ZPD. In this process, interactional material is mediational only if the learner can gain access to it (e.g. comprehension, assistance, ZPD), which can activate cognitive processes. Thus, past knowledge is intertwined dialogically and dialectically with the present activity.

A Vygotskian SCT approach to SLA in education brings a transformational philosophy to learning and development in the L2. This framework views learning through the mediational use of tools and that students can develop higher-level mental functions during the internalization process. SCT brings a dynamic and ecological perspective to SLA, which takes into consideration that the tool and the individual change through learning and development in the second language. In this theory the mediational interaction between the learner and interlocutors, physical tools, and psychological artifacts, cannot be cleanly compartmentalized. This stands in contrast to many mainstream SLA approaches based on input/output approaches and cognitive theories,

which have traditionally viewed the native speaker and non-native speaker in static positions of expert or novice.

A common feature of input/output theories and cognitive approaches are their tendency to view social interaction and SLA in a static and compartmentalized fashion. The field of SLA in formal education has been influenced by studies which pre-established standardized performance characteristics based on interaction with NNSs. These studies do not account for an individual's development or the actual process of learning, but instead demonstrate how the addition of certain components of language learning can be identified and applied to support specific practices and tasks that may assist the learner in meeting pre-selected language standards. In cognitive approaches, language learning is viewed as an acquisition of rules and ultimately an individualized process. Thorne (2000) explained that psychological and cognitively oriented approaches to SLA are based on "the individual and his or her language related mental functions" (p. 223).

Ohta (2000) addressed a problem with input/output studies explaining that second language learners should be looked at as both "speaker/hearers" and not processors of input or producers of output (p. 51). Specific to L2 acquisition, Ohta states that developmental processes are realized in the interaction and not as a resident in the language learner's mind. The rigid boundaries of thought and learning as found in many input/output comprehension-based approaches are not found in an SCT language learning approach. In cognitive input/output approaches, material carriers are not considered as potential mediational tools.

Similar to communicative language teaching (CLT) approaches, a SCT approach to second language emphasizes communication, collaboration, context, and meaning as central components to learning. However, CLT as a method in formal education situations has often been interpreted and applied as a process in gaining the competency standard as established by the teacher. In this case, competency is not necessarily viewed as "native-like" but has often been interpreted and applied as teacher driven. Although acknowledgement of key communicative components such as the instability of language systems, negotiation between interlocutors, and the integration of form-focused tasks are addressed, CLT is often viewed and applied as only a communication method of practice between participants. Bax (2003) states:

> Although it [CLT] has served a useful function in the profession… CLT is now having a negative effect, and needs to be replaced as our main focus…CLT has always neglected one key aspect of language teaching – namely the context in which it takes place (p. 278).

An SCT framework in SLA differs from input/output and cognitive approaches and extends the CLT center on meaning by focusing on human development and learning and not on static constructs of language or the analysis of specific components of an interaction. An SCT approach does not remove context and meaning from the interaction but accounts for the complexity of meaning-making between both interlocutors engaged in the learning process. This engagement is not solely to facilitate further interaction to produce more practice. It is also not limited to negotiation between interlocutors to make meaning. Instead, in an SCT educational model, the teacher or more advanced collaborator develops and adjusts with the learner during the task at hand. In SCT,

communication is not just an understanding between participants but a space where a speaker/learner can appropriate the language. Language learning is about meaning and making the word one's own with one's own historic background and "accent". In SCT, language is not viewed as a neutral medium to be passed back and forth between speakers but is infused with context and someone else's words (Bakhtin, 1981). Hence, compartmentalized language variables as viewed by traditional SLA research are not the primary target. Instead, primary focus is placed on language's mediational use and ability to help meaning-making for the individual, which leads to cognitive development.

SCT takes an ecological educational approach to learning, with the understanding that there are contingencies and affordances that humans encounter during social interaction in the world. Vygotsky's work takes "situatedness" into account, meaning, that learning unfolds in different ways under different circumstances. It is this dialogic interaction that provides accommodations and necessary flexibility highly needed to understand learning and development in SLA.

SCT and the Bilingual Student

Vygotsky (1987) did not address second language learning as a central component of his research. However, he did study the differences between native and foreign language learning as a parallel example to the spontaneous and scientific conceptual learning that occurs for school children. He explained that children learn their native or first language differently from a foreign or second language in school. In first language learning, the child gains language use without conscious awareness or intention. In the native language, the more elementary characteristics of language such as oral and aural speech arise first. The child learns to move about their language with the use of differing

grammar forms without a conscious awareness of these forms. Their speech tends to be more spontaneous and free. More complex forms such as writing tend to develop later through a more conscious level. The acquisition of a first language is not fully conscious, explicitly learned, nor fully self-regulated. Lantolf & Thorne (2006) explain that the goal of native language acquisition "is not to learn the language *per se* but to participate in the practices of the community. Thus learning the language and participating in the community co-occur and feed into each other" (p. 294).

According to Vygotsky (1987a), foreign language learning in school is mediated by the child's native language. He specifically addressed meaning made in the first language as the mediational tool for learning a second language. He stated, "The child already possesses a system of meanings in the native language when he begins to learn a foreign language. This system of meanings is transferred to the foreign language" (Vygotsky, 1987a). This relationship can be seen in the development of scientific or school taught vocabulary concepts in the second language. The relationship between the foreign word that labels the object is typically not a direct one but is mediated through the semantic aspect of the native language. Lantolf & Thorne (2006) explained that reliance of the L1 in learning a L2 was often a result of a learner's psychological link with their native language acting as a leading mediating artifact and not just the filling in of knowledge gaps found in their L2. In addition, the mediational use of the L1 to learn a L2 is not a direct nomenclature transfer but a process where new relationships to the words and objects develop. In a dynamic and developmental way, the student is made conscious of words and objects in a different way when studying a second language. This

asymmetrical form of learning is at the heart of the process of development of higher mental functions.

In foreign or second language courses in school, the child learns with a conscious and intentional construction of the language. The study of alphabets, symbols, vocabularies, and definitions tend to be found at the beginning of second language learning. In most foreign language classrooms, conscious awareness of phonetic and grammatical forms develop first, and the spontaneous use of speech and an ability to address meaning in a variety of contexts tend to come later. Hence, spontaneous fluent use of a second language is usually seen as the more difficult and latter developed process; whereas, first language learning leads with unplanned fluent use. The strength of the one tends to be the weakness of the other, demonstrating a parallel to Vygotsky's (1987a) spontaneous and scientific concepts.

However, prepubescent school aged children becoming bilingual and situated within the second language culture learn language in a different manner than their foreign language learning adolescent or adult counterparts. In this case, formal instruction such as learning the alphabet, colors, numbers, vocabularies and definitions as found in the first chapter of typical foreign language texts are not the primary means of learning and using a second language.

Young children in a second language learning elementary situation do not have the same conscious access to prior knowledge in comparison to older SLLs. A student's reflection and the emergence of inner-speech by the eighth year in their L1, provides them with an orientation of needs and desires. However, conceptual knowledge and metalinguistic capabilities are not in their developmental stage (Vygotsky, 1987a). In this

situation the ecological affordances around them, takes precedence over scientific, systematic conceptual teaching of the L2.

Pedagogical Implications: SCT and Second Language Learners

Young bilingual children living in the culture of their second language primarily learn language through their ecological experience parallel to the spontaneous manner in which they acquired their L1. A child's focus on objects and images in the present, feeds directly into their associative complex cognitive abilities. Vygotsky's (1986) statement of the direction of development of thinking going from the social to the individual continues to carry through in the L2. As a result, a systematic and structured second-language learning curriculum is a secondary source to the child's bilingual development. The child does not enter the L2 culture with explicit knowledge that there are syntactic conventions and lexical pieces in the second language. Instead, the primary source for becoming bilingual in the L2 culture is the culture itself. In this case, *imitation* plays a leading role in the child's learning of an L2. The child is surrounded in the L2 culture with meaning-making in context. Hence, it is in the cultural-social plane, with the accompanying naturally situated semiosis that provides the learner with a holistic and syncratic understanding of language that provides a foundation for L2 development.

One implication of a young child's bilingual development in the U.S. is the call for ELL placement into mainstream classrooms, whether by full-immersion or under through transition into the inclusive classroom. However, these paradigms are often misguided in that they focus on assimilation to mainstream culture and language with little regard for the benefits of maintaining a student's bilingual ability. As explained well by Cummins

(1996, 2000), the non-English speaking student will have extreme difficulties in learning content in an English-only classroom. Children may acquire basic interpersonal communication skills within six months to a year; however, this pattern does not necessarily hold true for their acquisition of academic content based language. Instead, it may take ELLs anywhere from 6-8 years to catch up to their English speaking native peers.

In addition, full English immersion programs are not implemented to build bilingualism. A focus on English only in the U.S. is detrimental to the development of the child's first language. Typically, some objects, words, or topics learned at home are never addressed at school and some objects, words, or topics learned at school are never addressed at home. At times, some topics and perspectives are not easily transferred between L1 and L2 lexicon and metaphoric concepts. As the child grows older, larger conceptual functions are developed and the scientific teaching of them may not easily transfer linguistically from their English-only classroom to their L1. Beyond the discrepancy in content learning, another consequence for the lack of accepting and highlighting an English learner's first language is the rejection of their identity and culture. Whereas some groups call for English-only with little to no accommodations and others call for assimilation for ELLs, both often neglect to address the positive contributions bilingualism and diversity brings to the classroom and our society at large. Instead, educators view their jobs as a search for ways to "solve" the ELL problem (Cummins, 2000). As mentioned earlier in the chapter, this may have a profound effect on the meaning [znachenie] that children have already produced in L1 experience. A dismissal or focus on just assimilation to the L2 by an educational curriculum, reduces

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the meaning that grounds the second language learner's understanding of the world around them.

Specific to the U.S., elementary teachers must be mindful of the fact that SLLs do not have the foundational, spontaneous use of the second language being used in the classroom. The quality and use of the L2 in the classroom becomes very critical because teachers must take into account that language is a major part of cognition. According to Vygotsky, all higher forms of learning, including second language learning, is about the external and internal mediational process of new associations and concepts concerning physical and psychological signs.

An SCT view of pedagogy focuses on presenting a variety of mediational tools, especially in language and dialogue, to allow for the dialectic and dynamic struggle between lower and higher psychological functions. A pedagogical approach that considers the affordances of the surrounding ecology and the mediational potential of language in meaning-making provides for a variety of social interaction and learning paths. Specific to ELLs, a space and process should be presented to allow the dynamic tension between diversity and homogeneity in the two languages, which includes a student's L1 and L2 voice and identity. A space that allows for both lower and higher psychological concepts to dialectically synthesize in the development of consciousness, provides the teacher and students paths of learning filled with meaningful experiences and interactions.

In an SCT ecological view of learning, one realizes that there are always contingencies to consider in a particular strategy, method, approach or curriculum, and that there should be no rigid "prescriptive" method for teaching and viewing learners and

their development. As a result of mainstream standardized curricula and scripted lessons in the US, the full meaning of stories, instructions, and other learning tasks, are often created with little regard for the English language learner and disregards the view of future development as theorized by Vygotsky's ZPD.

The most important implication of using a Vygotskian SCT framework in viewing education and second language learning is that signs are used mediationally for learning and development. Vygotsky viewed learning by the student as a holistic process, where the mind is not separated from the body. Access to psychological and physical mediational tools afforded in the environment allows teachers and students both a space and a process for learning. It is the entire embodied process of using artifacts surrounding the learner that assists people in development and transformation.

CHAPTER 3

GESTURE LITERATURE REVIEW

Introduction

> *We respond to gestures with an extreme alertness and, one might almost say, in accordance with an elaborate and secret code that is written nowhere, known by none, and understood by all.*
>
> Sapir (1927)

Gestures are so integrated into our everyday life that most people never consider the multiple functions they perform. Knowledge of gestures and their role in one's culture is typically acquired unconsciously in conjunction with one's first language. It is interesting to note that although people are capable users of their native language, they often find it difficult to dissect their language from a holistic use to the syntactic building pieces that provides its foundation. Foreign language teachers often hear from students that it is in the confrontation of learning a second language that they become conscious of and acquire foundational knowledge of their first language. This phenomenon extends to our use of gestures as well.

In American mainstream culture, gesture use is very much in accordance to Sapir's (1927) statement above, where it is used but usually not explicitly taught. Other cultures, such as some Native American, and East Asian, such as Japan, contain rich levels of non-verbal behavior that is more overtly codified with social awareness of its use. Gestures do play a large role in understanding languages and their accompanying cultures. Although Sapir's statement may contain some universal truth, this statement does not consider the differences found in gestures concerning second language learning.

Organization of Gesture Literature Review

This chapter contains six major sections: (1) Gesture Overview; (2) Gesture's relation to cognition; (3) Gesture and the formal classroom; (4) Gesture and second language learning (SLL) through a sociocultural theoretical (SCT) perspective; (5) Gesture and Embodiment; and (6) Gesture, SLL, and SCT in and beyond the classroom. The first section after the overview contains research based on gesture's role in cognition. The second section provides a review of studies based on gesture in the formal educational settings. This section includes a review of findings demonstrating a relationship of gesture and second language learning and implications of these studies. The third section shifts this literature review from one based on mainstream studies to the understanding of gesture and SLL through a SCT perspective. The fourth section provides studies explaining the relationship of gesture as part of an embodied learning experience. The last section is based on SCT perspectives of the relationship between gesture and SLL including implications of these studies. The implication sections provide an argument for the important role gesture plays in understanding second language learning and the holistic approach found in sociocultural theory. I conclude the entire chapter with a summary of the role mediation plays in learning and development and how gesture as a semiotic tool and sign has been found to help in the learning of a second language.

Gesture Overview

Gesture is concerned with all types of bodily, non-vocal communicative acts, particularly with hand motions, body postures, and facial expressions. It can be used in the visual, the tactile, or auditory modalities (McNeill, 1992; Kendon, 2004). They are

often performed to create a shared understanding of context between humans. Gestures may be at the very root of communication by humans as the origin of language between them. Gestures of early humans may have been the starting point on the road to the use of symbols and language for communication (Hewes, 1973; Call & Tomasello, 2007). Perhaps one of the earliest gestures performed by humans were referential in that they attempted to communicate interpersonally (Zlatev, 2002). The view of gesture in classical antiquity was also viewed as a part of communication that created a sense of force or power to influence or persuade people. Particularly with the Romans, gesture was considered to be an important part of good rhetoric (Kendon, 2004). Describing this line of thinking for speech, Cicero stated: *Actio quasi sermo corporis*; translated, "Delivery (is), in a way, the language of the body" (De oratore 3, 222).

Darwin (1965) suggested that gestures are innate, universal, and accompany oral communication between people of all cultures. Boas (1897, 1944), Efron (1941) and Sapir (1927), furthered Darwin's analysis, explaining that although gesture was innate, many are culture specific and perpetuated by the society to the individual. In contemporary times, Duranti (1997) proposed that the predominant view of gesture by most anthropologists and linguist is its function as a part of face-to-face verbal communication. Most discourse and communication researchers follow the viewpoint that gesture is a fully integrated part for understanding human culture and interaction (Goodwin, 1984; Gumperz, 1982; Kendon, 1973, 1990; Schegloff, 1984). However, it should be noted that much of the content of these seminal pieces viewed gesture as a part of the transmission of speech in a nonverbal form or as contextualization cues to the message being carried by verbal speech.

Gesture's Relation to Cognition

In the last thirty years the study of gesture began to be viewed for its role and effect in cognition by both psychologists and linguists beyond its interpersonal communicative functions (Kendon, 2004). One result has been the hypothesis that gesture plays an integral part of cognition and memory. Many researchers have found that teachers consistently use gestures in both individualized and group instruction in the classroom (Goldin-Meadow, Kim, & Singer, 1999; Neill, 1991; Roth & Welzel, 2001). Building off of this premise, Susan Goldin-Meadow (2003) devoted years of research and study with children and adults solving arithmetic problems and the role gestures play in thinking. A large and growing body of work demonstrates gesture's role in cognition, with research showing how it improves listening, memory, and cognitive development (Alibali & DiRusso, 1999; Alibali & Goldin-Meadow, 1993; Cook, & Goldin-Meadow, 2006; Church & Goldin-Meadow, 1986; Goldin-Meadow, 1997; Goldin-Meadow, et al., 2001; Goldin-Meadow & Wagner, 2005; Wagner, Nusbaum, & Goldin-Meadow, 2004). Two particular studies, Cook & Goldin-Meadow (2006) and Singer & Goldin-Meadow (2005) compared the use of gesture and non-use in teaching strategies in the classroom.

Cook and Goldin-Meadow (2006) argued that the addition of gesture to spoken instructions increased its effectiveness in teaching math to children. In this study, third and fourth grade students were given explicit math solving gesture strategies in comparison to those who were only given the usual instruction. Cook and Goldin-Meadow found that the students receiving the gesture strategy produced it during posttests and scored significantly higher than their non-gesturing peers.

In Singer & Goldin-Meadow (2005) 160 children in the third and fourth grades were given mathematical equivalent instruction. The children were divided into groups that received no specific gesture instruction accompanying the verbal, gestures that reinforced the same verbal instruction message, and gestures that conveyed a different strategy than the accompanying speech. Singer & Goldin-Meadow found that the students who received the gesture strategy that differed from speech were better able to use the principle of equivalence in performing and explaining mathematical problems in relation to the students who were not taught with the gesture strategy or were given gestures that only reinforced the same instruction as the speech. Some implications from this study includes the possibility that explcit knowledge of mismatching speech and gesture could be used as an effective teaching and learning technique for teachers and students.

In line with the Goldin-Meadow studies, Roth & Lawless (2002) suggested that students who use gesture and speech to explain scientific experiments, referred back to their symbolic form to access knowledge about them. Other research has implied similar results, demonstrating that within the actual process of referring back to the experiments, the creation of these symbolic signs at a later time also produced new knowledge (Glenberg & Robertson, 2000; Roth & Welzel, 2001).

Gesture, Cognition, & Communication

Kendon (2004) also addressed gesture in a more thorough fashion than as just a mode that reinforces a message carried by speech. He claimed that although visible bodily action often appears inseparable and fully integrated with speech, it also carries messages that speech does not. He emphasized that linguists and psychologists need to understand both if we are to have a full understanding of how utterances are intelligible between

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participants. His research gave gesture a more central role in communication and explained that it is needed to comprehend meaning between people. Kendon views gesture with spoken language as a relationship in which gesture, "complements, supplements, substitutes or [acts] as alternatives to them" (p. 1).

Kita (2000) differs from Kendon by viewing gestures as belonging to "spatio-motoric" thought processes. According to this theory, gesture is not just a reinforcement, cue, or aid to speech as addressed in traditional perspectives, but is a physical manifestation and reaction of a person imagining a virtual environment. Although Kita views many gestures as kinesthetic and reflexive according to stimuli around us, he still considers the speech-gesture relationship as a very tightly coupled process in thinking.

McNeill (1992, 2005) also studied gestures for their integral role in cognition and memory. Differing from both Kita and Kendon in his theoretical framework, McNeill approached gesture through a Vygotskian lens. He described gestures as embodied manifestations of cognition and how they can be material carriers that connect language and meaning to cognition. McNeill takes the stance that gesture and speech are central components in the production of thought. Following Vygotskian theory, McNeill explains that both language and image are two forms that combine dialectically to produce thought. He builds off of this concept and argues that both language and image, especially gesture, are both needed for meaning-making because they are dialectically connected. Unlike speech, which is linear, segmented and regulated by syntactic rules and structures, gesture has the capacity to provide meaning that is non-linear, non-segmented, holistic, and not expressed through linguistic means. Similar to Kendon, and Kita, McNeill points out that gestures are not equivalent to speech, but gestures can

provide lexical, semantic, and pragmatic information not presented orally but found in the speaker's thoughts for both interlocutors. McNeill (1992) introduced an explanation for the intertwined relationship of gesture and speech in thinking as the "growth point hypothesis", which is discussed later in this chapter.

Gesture and the Formal Classroom

Bruner (1996) explained education as "a complex pursuit of fitting a culture to the needs of its members and of fitting its members and their ways of knowing to the needs of the culture" (p. 43). Specific to a formal school setting, the sharing of human knowledge and culture is largely considered as performed through language, with verbal instruction typically viewed as the predominant mode of communication. Traditional classroom instruction and curriculum focus on a limited perspective of language and communication with exercises that focus on the analysis of phonetic, lexical, and syntactic rules. However, a study of the codified rules of a language does not account for the communication needs of a classroom. Although verbal communication is often considered the predominant form for sharing instruction, nonverbal communication has also been identified for its importance to the classroom.

Nonverbal behavior, such as gesture, in the mainstream and L2 classroom is an important topic to study in education because it is an important mode of human communication and transcends many discourse barriers found linguistically. However, it is often viewed as a secondary form because it is usually learned unconsciously, lacks the formal rules of verbal or written languages, and is often taken for granted in one's own culture. Whether we are aware of it or not, gestures play an important role in understanding communication.

Teachers use gesture in the classroom, and when accompanying instruction it has been found to promote learning (Flevares & Perry, 2001; Goldin-Meadow, Kim, & Singer, 1999; Neill, 1991). Teachers often produce nonverbal communication (NVC) such as gesture, as a result of the complexity of working, assessing, and communicating with 25 to 30 students (Neill, 1991). NVC plays a large role when a teacher wishes to influence the classroom or student in a quick and immediate way and it plays a strong role in influencing the overall affect of the classroom.

Specific to EFL classrooms, nonverbal behavior (NVB) has been researched in several empirical studies (Antes, 1996; Grant & Hennings, 1977; Kellerman, 1992). Many leading researchers in the field of SLA have also taken note of gesture's role as an extralinguistic cue or extra communication channel, which reinforces verbal speech and affect in the language classroom (Krashen, 1981; Long, 1989). However, these studies have viewed gesture at a surface level, placing verbal speech at the heart of communication.

Gesture & Second Language Learning

Gesture studies are relevant to second language learning (SLL) because of its role in communication and cognitive development (Gullberg & McCafferty, 2008). Gullberg (2006) explains that research studying gesture in the field of SLA has primarily been focused for the following four purposes:

1. Gesture is part of what learners can acquire in a target language and thus can be studied as a developmental system in their own right both for L2 production and comprehension.

2.   Gesture use by L2 learners provides insights into communicative and cognitive aspects in SLA.

3.   Gesture as a compensatory function in communication

4.   Gesture linked with speech in language, offers valuable insight as to the processes that occur in L2 acquisition such as handling expressive difficulties, engagement levels of the L1, interlanguage balancing, and assessing process and planning difficulties in the L2.

In Gullberg's literature review of gesture studies relevant to SLA, she calls for more L2 studies to fully integrate gesture use to inform their theories and understanding of L2 learning and use. A need for more studies focused on language in use as compared to studies focused on the acquisition of competency would provide us with a better understanding of how gesture is used as a mediator of meaning and how meaning-making occurs between participants. Specifically, there is a need for research based on the integration of language study with the social and ecological environment in which it is produced. This integration would call for an analysis of both speech and gesture in language.

The study of gesture contributes to the understanding of SLA in and out of the classroom (Allen, 1995, 2000; Gullberg, 1998; Lazaraton, 2004, Lazaraton & Noriko, 2005; Neu, 1990; Sime, 2006; Stam, 1996; Zhao, 2007). The study of gestures in second language acquisition produces not only an expanded view of how native and non-native speakers deal with communicative difficulties but how they actually learn and develop in the language. Stam (2006) explained gesture for its additive components to speech in communication. She divided speech and gesture to make the point that an examination of

both provided researchers with a more thorough understanding of the inner thoughts and workings of the mind. Stam basically proposes that gestures can help others obtain a clearer picture of the L2 learner's progress than by looking at speech alone. This added insight is invaluable for both the teacher and the learner. It is possible that by studying gestures both participants can better assess the students' needs (Lantolf, 2000; Lantolf & Appel, 1994; Lantolf & Thorne, 2006; Stam, 2008).

Gesture production by second language learners should not be viewed as synonymous to production by "native-speakers." Whereas gesture often corresponds strongly with the same intentionality of L1 speech in interpersonal communication, gesture has been found to supply a variety of assistance for learners of a second language. Concerning a second language, empirical studies have shown that gestures play a strong role in overcoming language barriers that impede communication and that they compensate for difficulties during speech production (Adams, 1998; Gullberg, 1998; Hauge, 2000; Jungheim, 1991, 2008; Lazaraton, 2004; Lazaraton & Noriko, 2005; Mohan & Helmer, 1988; Mori, 2004; Mori & Hayashi, 2006; Yoshioka, 2005; Yoshioka & Kellerman, 2006). These studies are discussed in detail below.

Jungheim (2008) notes that studies in pragmatics have generally ignored the role of gestures in speech acts between native speakers and language learners. Analyzing specific Japanese refusal forms, Jungheim looked at both native and non-native Japanese speakers using eye-tracking devices and had them watch video of Japanese refusal acts performed nonverbally as a gesture. The refusal act included a combination of hand-waving and body and head tilts. The gestures, without speech, in this study carried pragmatic messages to both the Japanese native speakers (JNSs) and the Japanese second

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language (JSL) participants. Jungheim presented results showing the JSL with only six months of experience were able to understand the semantic content of refusal act gestures, although they were only short clips that were videotaped and abbreviated to display just the act of refusal. Although there is a caveat of the generalizability of the study, it does provide some evidence that gestures and body movements play an important part of understanding culturally embedded meanings and that NNSs can connect to these meanings through the nonverbal channel.

The ability to learn about culture, identity, and other pragmatic aspects of a language through gesture and mimesis has been shown to be possible. Cook & Goldin-Meadow (2006) have demonstrated that children will use gestures that have been correctly modeled in a correct form. They state:

In sum, our attempts to manipulate children's gesture by *modeling* gesture had the desired effect—children who saw gesture produced gesture, and their gestures reflected the content of the gestures that they saw. Furthermore, this effect did not appear to be mediated by children's understanding of the instructor's speech, or by children's own propensity to gesture" (p. 218).

Learning from a mimetic channel such as displayed in Cook & Goldin-Meadow is not unique to only math studies but has also been found in narrative studies such as Yoshioka (2005) and Yoshioka & Kellerman (2006).

Analyzing gesture, particularly deictics during narratives, Yoshioka (2005) and Yoshioka & Kellerman (2006) demonstrated that gestures as a referent should also be of interest to second language teaching and learning. Yoshioka analyzed gesture for its ability to reference specific animate and inanimate objects during discourse. Results

demonstrated that gestures introduced and tracked these objects throughout the conversation. Gestures were shown to clearly identify the objects, to reference them in relation to other objects, and repeatedly followed these objects through various series of events as the discourse unfolded.

Gesture studies in the L2 classroom can also provide insightful information in how to assist the learner. Mohan and Helmer (1988) compared gesture emblems such as nodding the head to mean "yes" or "no" or making a motion "to be quiet" between age-matched native and non-native English speaking children. Mohan and Helmer found that the non-native children understood significantly fewer gestures than the native children. They also found a positive effect for comprehension by the students that had a higher amount of engagement and time in the L2 environment. The researchers suggested that emblematic gestures could to be taught to and learned by the second language students, assisting in their comprehension abilities.

Gesture in an L2 classroom, is often observed to such an extent by the students, that they are aware when a teacher's gesture does not match with the corresponding speech. Hauge (2000) demonstrated how L2 learners in a British English class were actually confused over culturally specific gestures demonstrated by the teacher in the classroom. In this case, students referred to their L1 understanding of an emblem, which was a cause for confusion with the meaning the teacher attached to the gesture. One implication of this study is that it is very likely that teachers are not usually cognizant of the cultural bias in their gestures while they are teaching. Although it would be impossible for a teacher to disassociate their gestures with their language in the classroom, it is possible to support L2 learners by delivering explicit instruction on cultural emblems.

Jungheim's (1991) study of Japanese learners of English demonstrated the value of emblematic gestures for language learners. In this study, one group of students was given explicit instruction in American emblems compared to those that were merely exposed to them. Results showed that those with the instruction did better on the post-test than the group that was left to deduce emblem meaning. These studies suggest that for more substantial second language acquisition to take place, students must have some understanding and be meaningfully exposed to gestures. Future studies concerning explicit gesture instruction could provide L2 learners reinforcement and additional information they need for naturalistic language use in context.

Lazaraton (2004) and Lazaraton & Noriko (2005) described the importance of focusing and including an analysis of gestures in SLA discourse. In Lazaraton (2004) gestures were found to enhance communication for second language learners. She concluded that gestures compensate for difficulties with the verbal channel, which supports similar findings by Gullberg (1998).

In Lazaraton & Noriko (2005) both researcher and teacher collaborate in understanding second language learning through a microanalysis of gesture and speech. Both studies suggest that educators and research analysts may receive beneficial insights from teacher-directed, self-reflective action research and researcher-directed microanalyses of the classroom discourse. Teacher education programs may want to stress the importance of nonverbal behavior in L2 teaching. Although nonverbal communication reinforces or delivers meaning not communicated by verbal messages, it largely has been neglected in L2 pedagogy. They state:

If nonverbal communication is to be counted as an effective teaching aid or strategy, then it needs to be given more attention in teacher development programs. Native speakers use nonverbal communication at a subconscious level, yet language teachers must become aware of its largely culturally specific nature as well as the ways they actually use it and how it can be best exploited in L2 teaching (p. 539).

Lazaraton's call to study SLA in the classroom with an eye towards the use of gesture and other artifacts surrounding the students rather than just relying on audio-taped recordings of the oral linguistic messages between the teacher and students demonstrates some direction towards understanding language within the ecology of the classroom. Although Lazaraton (2004) and Lazaraton & Noriko (2005) placed a focus on the study of SLA discourse through both speech and gesture, her studies did not extend themselves towards a broader understanding of the mediational role and genetic development of the gestures between interlocutors. The actual purpose and quality of the gesture as an act of illumination of meaning is not fully addressed in these classroom-based research studies in a holistic, larger sense.

Similar to Lazaraton's work, Mori (2004) and Mori & Hayashi (2006) demonstrated a balanced approach to understanding language learning by including both verbal and non-verbal components in her analysis. Mori's (2004) case study on a Japanese second language learner in North America used conversational analysis to identify self-repairs and word searches in conversation. Mori found that both the NS and NNS were highly engaged in interpreting each other's non-verbal cues to facilitate meaning between them. At times the non-verbal behavior superseded the verbal with messages being sent from the NS to the NNS to correct or restate an idea. In addition, the NNS also sent non-verbal

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messages often stopping the NS, thus gaining time for the NNS to correct their own mispronunciations or search for the appropriate lexicon. Mori also found that at times the NNSs seemed to glance away and not search for referential cues from the NSs but concluded that NNSs still demonstrated that they were highly engaged in performing in the language.

In contrast to many studies that demonstrate the need for the NS to demonstrate and provide the correct answer, Mori suggested that many learners want to struggle through lexical searches and perform self-repairs without verbal correction from the NS. She suggested that cues for correction through non-verbal modes were at times more valued by the NNS.

Mori & Hayashi (2006) also demonstrated the importance of embodiment in conversations between a native speaker (NS) of Japanese and a non-native speaker (NNS) of Japanese. The researchers asked whether embodied completions helped facilitate intersubjectivity between interlocutors. Following the same setting and methodology as Mori (2004), the researchers coded and counted the physical shifts between interlocutors in conjunction with their verbal speech. The researchers found that the native speaker (NS) and the non-native speaker (NNS) shifted in theirs seats at different times for different purposes. The NS often shifted in search of additional information such as lexical accuracy of when the NNS made incorrect statements. The NNS shifts tended to be in conjunction with his counterpoints and disagreements with the NS's statements. They found that the two would correct statements, retract, or rephrase when non-verbal behavior adjustments in their positioning occurred after certain statements, or words. The researcher's findings demonstrated a strong connection for the social use of language and

that it is nearly impossible to provide error free speech by the NS. In addition, the NNS clearly displayed non-verbal linguistic messages when he made linguistic mistakes or disagreed with what the NS was saying. Moreover, this study shows strong evidence of gesture and non-verbal communication in creating intersubjectivity. The bodily shifts provided an embodiment of what was said and also helped the participants realize the need for retractions, rephrases, or repairs in the discourse.

Both Mori (2004) and Mori & Hayashi (2006) reinforce the importance of gesture's role in social interaction as an invaluable aspect of SLA. They provided evidence that body language and non-verbal behavior communicates the need for assistance, correction, and reliance level with a NS in learning and using a second language in conversation. Implications to these studies included the need for language teachers to consider studying body language and non-verbal behavior formally. It is possible that formal instruction on gestures may help teachers interpret their students' body language including their language needs, which may range from immediate help to no assistance at all.

However, it should be noted that Mori (2004) and Mori & Hayashi (2006) only identified specific components and needs during certain discordance points in conversation. These studies do not take into account or address the larger picture for understanding how gesture in conjunction with speaking, thinking, and the ecology of the situation, works dialectically together in both participants' learning and development. Although there is evidence that discordances can be overcome and repaired, the larger question of whether this leads to meaning-making, learning, and development in the second language is not fully answered.

Another underlying element of SLA is Foreigner Talk (FT), also known as "learner-directed speech" (Ferguson, 1971). FT has traditionally been defined as a register shift by native speakers (NSs) during interaction with non-native speakers (NNSs). This speech shift was identified in the 1970s and studies continue to perpetuate the view that the NS can make "best practice" accommodations to develop comprehensible input for the NNS (Ho, 2005; Mori, 2004; Shamoosi, 2004; Tsang, 2004; Wooldridge, 2001; Wu, 1993; Yano, Long, & Ross, 1994). The accommodations in these studies address language features of FT such as using repetition, comprehension checks, simple topics, basic question and answer discourse exchanges, decomposition of the grammar, and the use nonverbal communication. Researchers have found that gestures align with speech functions in FT (Adams 1998; Henzl, 1979; Long, 1981, 1985; McNeill, 1992;). However, these studies were limited in their address of the interactional meaning produced by gesture and FT in SLA.

Adams (1998) specifically addressed SLA and gestures in his dissertation study of *Foreigner Talk Gesture*. His dissertation research question was whether or not native speakers (NSs) modify their use of hand gestures in ways that can function to assist comprehension. He limited his view of gestures to five major types, pantomimics, iconics, deictics, metaphorics, and emblems. He hypothesized that the NSs would use more pantomimics, iconics, and deictics when they addressed NNSs than when they addressed other NSs because of the gesture's ability to function with less speech accompaniment and their ability to add more explicit information to the speech. In this quantitative study, participants were young female adults between the ages of 19 and 24 for both the NSs and NNSs. A conversational and gesture analysis was performed.

Findings concluded that NSs did modify their gestures and there was an increase in all gesture categories when speaking to NNSs as compared to NSs. The statistical data showed that gestures were modified significantly in times of conversation repair and clarification between NS- NNSs, in comparison to NS-NS exchanges. The study suggests that this modification did assist in communication comprehension.

Implications of Gesture & Second Language Learning

Gesture's roll in communication is multi-modal. Studies have shown that gestures are used to clarify verbal ambiguity (Gullberg, 1998), have a positive effect on memory (Goldin-Meadow, 2003), and operate as a form of spatio-motoric thinking (Kita, 2000). Gesture has been found to help organize information, reference spaces, and emphasize ideas (Kendon, 2000, 2004; McCafferty 2002). It also has been found to facilitate output production, reduce redundancy (Goldin-Meadow, 2003), effect elisions, assist in lexical searches (McNeill, 1992), demonstrate levels of knowledge (Broaders, S.C., Cook, S.W., Mitchell, Z., Goldin-Meadow, S., 2007), and materialize thinking both for the self and social interaction (Call & Tomasello, 2007; Tomasello, 2008).

Gesture also has the capacity to provide meaning that is not expressed through linguistic forms (McNeill, 2005). It can both supplement and complement verbal speech and provide lexical, semantic, and pragmatic information for both interlocutors (Gullberg, 2006; Kendon, 2004).

The use and understanding of gesture in SLA and teaching may be indispensable for meaning making between participants. Activities and actions performed by L2 learners

and teachers can manipulate, modify, or rearrange the environment around them to facilitate understanding of a person's goals, interests, expressions, and motives.

However, an important limitation arises with the results and findings of the mainstream research concerning SLA and gesture; most are limited in accounting for how people make meaning through the use of language in the world. In particular, the field of SLA contains a body of work that views gesture as a paralinguistic feature that facilitates comprehension and language learning in social settings (Adams, 1998; Ho, 2005; Mori, 2004; Shamoosi, 2004; Tsang, 2004; Wooldridge, 2001; Wu, 1993; Yano, Long, & Ross, 1994). Most approaches in these studies demonstrated the investigation of gestures as modifications and tools to assist the L2 learner's comprehension, which follows the input/output approaches of many SLA mainstream theories. This approach limited their results and findings by not addressing how learning, thinking, and language use, leads to meaning-making and development for the learner. Instead, research such as this continues to demonstrate a strong focus on the transmission of language between NSs and NNSs. They do answer research questions concerning specific compartmentalized verbal and gestural functions but do not extend themselves towards meaning-making and development by the NNSs. In particular, they do not account for appropriation, internalization, and transformation of the shared signs between participants.

Although many L2 gesture studies follow a social constructivist approach to teaching and learning, research based on input/output theories or communicative approaches do not address learning as dynamic, situational, and ecological. Hence, speech and gesture in language and thought are left as artifacts to be transmitted and not as mediational tools for understanding learning and development.

Gesture and SLL Through an SCT Framework

An SCT framework concerning the study of gesture is an integral component to understanding thought, learning, and development by teachers and students of SLL. Vygotsky (1987a) explained that thought is synthetic and unpartitioned; whereas, speech is analytic and partitions thought into syntactic ruled structure. Vygotsky (1997b) stated:

The development of speech reorganizes thinking and translates it into new forms. The child who names separate objects in describing a picture has not yet reorganized his thinking; however, the most essential fact is that a method has been created here that forms the basis for the construction of verbal thinking. What the child names as separate objects has a greater significance from the point of view of the biological function of his organs. The child begins to separate the unconnected mass of impressions that were merged into a single cluster; he separates and isolates clumps of syncretic impressions that must be separated in order to establish some kind of objective connection between the separate parts. Not thinking in words, the child sees the whole picture, and we have a basis for suggesting that he sees his life situation globally, as syncretic. Let us remember how syncretically connected all of the impressions of the child are; let us remember how this fact was reflected in the causal thinking of the child. A word which separates one object from another is the only means for isolating and breaking down a syncretic connection (p. 202).

It is in the introduction and use of the word that children begin to segment their holistic views of image and the world. This results in a dialectic between their thoughts as a whole and their ability to partition and analyze objects in segments.

In communicating thought in both a first and second language, both grammatical and psychological structures come into conflict with each other because the two do not correspond in manner. However, Vygotsky described that it is this dialectic that propels thought and language. Lantolf (AAAL, 2007) described this dialectic as the "fuel" that propels thinking and speaking. He explained that both gesture and speech are material carriers of meaning. Linguistic forms of language are material carriers of signs that have linear, syntactic, and grammatical content. In contrast, gestures carry speech imagistically and in a spatial-actional motion, in a non-linear and analytically whole method that often parallel the linguistic free psychological patterns developed in our minds. Although the two structures are opposites, they are both needed and inseparable in understanding first and second language and thought.

It is possible that through explicit analysis of gesture as a mediational tool and material carrier of meaning, L2 teachers and students will be better able to understand SLA concepts. A shift towards viewing language in its natural, culturally driven domain, privileges utterances and meaning-making over a rule based, competency driven linguistic system. The inclusion of gestures as a physical manifestation and an inseparable part of language is part of the ecology of learning a second language. Swain and Deters (2007) explain this physical manifestation concept through the term *languaging,* stating:

> Through languaging – a crucial mediating psychological and cultural activity – learners articulate and transform their thinking into an artifactual form, and in doing so, make it available as a source of further reflection (p. 822).

This artifactual form refers to Vygotsky (1987a), who explained them as physical and symbolic tools, which include people, language, and other semiotic signs that are found in the material world as mediational tools for cognitive development. He viewed language as the primary artifact for learning and development. He explained language as a synthesis of image and speech, inseparably connected to thinking. He also addressed gesture as an inseparable role in providing a physical artifactual form of language as a result of imagistic qualities. As stated in chapter two, the image of the object plays a large role in children's understanding of language whether in an L1 or L2. Their cognitive development, in both languages - whether consciously or unconsciously studied - move from associative complexities in a transformative nature to higher mental conceptual functions of the sign (Vygotsky).

Vygotsky (1978) explained that just as physical tools are created by humans to control and change their physical environment, so symbolic and psychological artifacts, as auxiliary means, empower us to learn and develop. In a Vygotskian SCT approach, the Cartesian dualism between speech and image, or verbal and non-verbal messages is rejected. Instead, embodiment of the message by both speech and image, such as gesture, between NSs and NNSs, provides materialization of meaning. This artifactual form of thinking is not a simple addition of images and words leading to the formation of new concepts.

Vygotsky (1997b) explained the process of conceptual development was not formed from simple repeated acquaintance with a topic or from identifying unique traits concerning the topic. Instead, development of a new concept was formed through a complex modification of the trait occurring during transformation of the image/topic. The

modification of the image/topic is found in the selection of parts and the removal of other parts. This is not a simple shift of elements found in the image but an actual transformation of them. The new image or topic is formed and a new concept is the result of intelligent composition. The reorganization of complex forms and the materialization and development of new concepts may be at the heart of learning a second language. Materialization of meaning provides the learner with an artifactual tool or a material carrier of signs that transforms thinking in the process itself. Material carriers, such as gestures, are able to promote meaning, understanding, and development in cognition including second language learning.

SCT, Gesture, Language, and the Growth Point Hypothesis

In an SCT view of language, speech and image are two different elements in thought. Thought and the word, in a continual process of movement, combine to construct not only meaning and sense linguistically, but more importantly lead to ontological development and consciousness. As discussed in chapter two, Vygotsky (1987a) focused on language as a central artifact to gaining higher mental functions. This view of language rejects Saussure's priority of *langue* over *parole*. Although well aware that the relationship between the signified and signifier changed over time, Saussure's (1916) explanation of *la langue* in a synchronic state, influenced the removal of the user in the study of language. In this case, the sign was placed outside of social intercourse, which established a structural system where signs only had meaning in comparison to other signs. Marxist theorists rejected this notion, explaining "The meaning of a sign is not in its relationship to other signs within the language system but rather in the social context

of its use" (Chandler, 2007, p. 9). An SCT framework places meaning and use at the forefront of the study of language *without* any distinction in competence and performance or *langue* and *parole*. The use of image, such as gesture, provides people with concrete, material carrying signs, that according to Vygotsky (1997b) and McNeill (1992), allows our consciousness an ability to grasp or anchor itself in a system of language and at the same time to continue to bring new material into consciousness, which then leads to higher psychological processes both ontologically and phylogenetically.

Gestures are an integral part of ontological development in humans (Call & Tomasello, 2007; Tomasello, 2008). In an SCT framework, gesture in the thought process does not only reflect thought but has an impact on its creation. McNeill (1992) argues that gesture affects thought because thought is shaped by its context. Hence, a cyclical relationship occurs as a result of gesture production coming in relation to the thought process and the thought process is in turn altered and affected by the physical production of the gesture. In this viewpoint, gesture is needed to understand meaning in the human acts of speaking and thinking. This intertwined relationship was described by McNeill (1992) as the growth point hypothesis (GPH). McNeill hypothesized that gesture and speech are so closely linked in time, meaning, and function, we should regard gesture and speech as different sides of a single underlying mental process. As stated earlier in chapter two, Vygotsky (1986) argued that the most elegant unit of analysis should be the smallest unit that contains the properties of the whole. Following Vygotsky's line of thinking, McNeill explained that in understanding thinking and speaking, the minimal unit must retain both the characteristics of language and thought. In mainstream SLA, a number of studies have resorted to reducing language into smaller units of analysis made

up of language components such as lexical searches, syntactic formations, repairs, grammar competency and such. These pieces however do not contain the characteristics of the minimal unit but actually destroy it. Instead, using Vygotsky's dialectic and microgenetic method, the relation of thought to word is a continual movement and process, which leads to sense and meaning of the whole.

For Vygotsky (1986) the minimal unit is made up of components that are dialectically opposed and unstable. He found that it was through this instability that change and development takes place. Similarly, in McNeill's (1992) GP hypothesis, a dialectic process between speech and gesture occurs to form differing dimensions of thought. In this dialectic, speech with it's social, segmented, linear, and successive characteristics come together with gesture as its opposite, with its idiosyncratic, imagistic, instantaneous, and holistic characteristics. This development does not necessarily occur with the first word to be uttered in a sentence but may actually proceed it in the germination of a thought.

Vygotsky (1978; 1986) provided examples of how gesture and speech work together to form thought and meaning visible on the social plane through the analysis of infants. For Vygotsky, gesture plays a central role in the ontogenetic development of humans. This development occurs through an ontogenetic ritualization, where two people help shape each other's activity in repeated instances of social interaction. In this form of learning, one human performs an action, not necessarily a communicative sign, and another individual consistently reacts to it by performing another action or reaction. Subsequently, the second individual begins to anticipate the first person's actions and continues to reply to the first action, with the same reaction. The first person then begins

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to realize that there is a pattern being established in the reaction of the second person. Subsequently, the first person begins to perform their action with an expectation that the second person will react in the usual pattern. At this point the initial behavior, which was first performed with no communicative intent, became a communicative signal through interaction over time between people (Call & Tomasello, 2007). This exchange exemplifies Vygotsky's interpersonal and physical plane interaction with the intrapersonal and psychological plane. A specific example of this is found in Vygotsky's study of infants and gestures.

Vygotsky (1978) analyzed a child's deictic (pointing) gesture, and how it arises from their innate ability to grasp and reach. He postulated that children's fingers make grasping movements in the air often trying to reach something. The child's unsuccessful attempt in reaching an object is eventually adhered to by a caretaker. In time, through this social interaction, the grasping movement by the child changes from trying to reach, to a social act of pointing towards an object to get what they want. The change is not just physical but social. The child has learned, through the social material plane, that pointing can replace grasping to obtain an object. Gesture in the case of infants leads vocalization in interpersonal communication. It is possible that gesture in learning a second language might also parallel this pattern. One parallel between a child's initiation of hand motion and a second language learner's use of gesture is the grounding of meaning for communication purposes created through nonverbal behavior by both groups of learners. As an example, at times both the infant and the SLL have a need to share lexicon that may be beyond their abilities to communicate to an interlocutor. Both the infant and SLL

may turn to gesture as a grounding and concrete form of sharing meaning from which further communication may be facilitated by the other participant.

Vygotsky (1986) demonstrated how gesture continues to play a mediational role in conjunction with speech and intentionality. He explained that gesture often defined the meaning of a young child's first words. Analyzing C. and W. Stern (1928), Vygotsky took a dialectical approach for the genetic explanation of the idea that intentionality develops from the indicatory gesture and the first word. The Sterns' focus on meaning helped them realize that a child's first words such as 'mama' does not necessarily mean the word 'mother' but instead means such terms as 'Mama, give me,' 'Mama come here,' or 'Mama help me'. Vygotsky furthers their analysis explaining that although the Sterns' study focused on meaning, they did not take a dialectical and genetic viewpoint of how this meaning is developed. He explained that the connotative meaning of the child was still inseparable and intertwined with the limited speech abilities in a "homogeneous whole" (p. 65). The only correct translation of 'mama' was to be found in the pointing gesture. In this case, it is possible that gesture played a more prominent role than speech in communicating the thoughts and intentions of the child. According to McNeill's GPH, this is possible because both speech and image bring distinct and unique properties that allow one or the other to take a leading role in expressing meaning (McNeill & Duncan, 2000).

Gesture viewed through an SCT framework is seen as a semiotic system that is intertwined with spoken language and thinking. Thus our ability to assign symbols and create linguistic signs is integrally related to the role that speech and gesture play, both externally and internally for people. An exclusion of gesture playing the role of image in

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understanding learning and development in humans demonstrates an incomplete unit of

thinking and language, and undermines the process for understanding and explaining

socially organized, higher forms of human cognition (Vygotsky, 1978; 1986).

Gesture & Embodiment

McNeill (1992, 2005) described gestures as embodying cognition. They are material

carriers that connect language and meaning to cognition (McNeill, 2005; McCafferty,

2006; Roth & Lawless, 2002; Roth & Welzel, 2001). According to Donald (2001),

"Physical self-familiarity is one of our cognitive touchstones, perhaps the basis of all

higher forms of self-awareness. Our bodies set the stage not only for conscious

experience, but for memory (p. 135). From the mimesis produced through gestures, SLLs

have the opportunity to not only gain comprehensible input, but are provided a larger

opportunity to gain self-regulation and consciousness of speech, image, and thought in

the L2. According to Donald (2001), "Conscious ideas and images are always owned.

This owning is highly physical and body-based" (p. 134). In this case, owning has to do

with the physical manifestation of ideas and images as a form of understanding and

meaning-making. This is supported by Roth (2002) and Roth and Lawless (2002) where

students demonstrated physical manifestations of their processes in learning and

understanding new vocabulary words and scientific concepts. Their gestures not only

demonstrated a correlation to the terms or concepts they studied but also helped create

new information as well. This coincides with McNeill's (1992) image-language dialectic,

which described gesture's place in cognition as the reality of verbal thought being

embodied and materialized. In this way meaning inhabits the speaker and is made present on both the social and psychological plane.

Accordingly, Kramsch (1998) refers to gesture, speech, and the many expressions they carry as an embodiment of cultural reality. It is through this embodiment that people often perceive whether they are accepted or rejected in a social group. As a result, this may play an extremely important role for immigrants and second language learners in a new country or culture. How to assimilate, if desired, and understand the new languaculture may be best performed through embodied learning or in other words, mimesis of cultural identity.

Mimesis & SLL

Donald (2001) described mimesis as "an analogue style of communication that employs the whole body as an expressive device. It manifests itself in pantomime, imitation, gesturing, [and] sharing attention …" (p. 240). Mimesis of identity, as a mediational tool between native and non-native speakers, is a foundational and concretizing tool for meaning making in discourse between native speakers and non-native speakers of a language. Mimesis affords the second language learner a physical and psychological mediational tool, which develops a superordinate conceptually shared foundation or stage for both interlocutors, where discourse components such as intersubjectivity, cohesion, and other interactional products appear. Unlike discourse patterns between NSs where cultural themes are shared, interaction between NSs and NNSs lack the transparency and shared pragmatic notions of NS to NS discourse. NS to NNS discourse begins with the construction of recognizable symbols (Call & Tomasello, 2007); Obstacles in communication between NSs and NNSs are surmounted by their

references to concrete and foundationally shared knowledge, which is often acquired through mimesis. McNeill (1992) states:

> Very often a gesture reflects a discourse function while the sentence does not, or does not clearly enough for an onlooker to notice it without having the functions revealed in the gesture first. Thus, gestures show something about the process of narration that would be missed if only the speech channel were regarded as the vehicle of narrative (p. 183).

As previously mentioned in earlier sections of this chapter, studies[1] provide evidence of challenges in the verbal channel being overcome through the mimetic form of gesture. It is also hypothesized that teachers that demonstrate a high level of iconic, deictic, and other imagistic gestures or physical bodily representations help enhance comprehension in the L2 classroom[2]. Understanding and performing gestures in a second language can be a key to avoiding misunderstandings in the target language. The use of gestures by an instructor creates a positive atmosphere and promotes comprehension for the students (McCafferty & Stam, 2008).

Gesture, SLL, and SCT in and out of the Classroom Setting

Although, studies and works such as Adams (1998), Gullberg (1998), Jungheim (2008), Kendon (2000, 2004), Kita (2000), Mohan and Helmer (1988), Mori (2001), Mori & Hayashi (2004), show that communication and language comprehension for NNSs needs to include both speech and gesture in SLL, they do not address language learning from a full SCT perspective. In an SCT perspective, second language learning is

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[1] Adams, 1998; Goldin-Meadow, Kelly, & Wagner, 2001; Gullberg, 2002, 2006; McCafferty, 1998; 2002; Mori, 2001, 2004

[2] Adams, 1998; Gullberg, 1998; Henzl, 1979; Lazaraton, 2004; McCafferty, 1998; 2002

approached dialogically and dialectically with social interaction, tools, and signs being

used mediationally as affordances for learning and development. According to Gibson

(1971) and van Lier (2004) affordances have to do with the relationship between an

organism, such as a learner, and artifacts, such as objects, people, tools, and physical and

symbolic signs, available in an environment. In relation to the affordances of an

environment, learners may act upon the opportunities the artifacts provide them

In an SCT perspective, second language learning is understood through its live use or

in vivo – including its genesis and the environment or context in which it takes place.

Specific to learning content and language in an adult foreign language classroom, Ohta

(2000) explained that development comes in the actual *process*. In this case, it is the

interactional activity, which takes the leading role in learning and development. Lantolf

(2000) explained that learning is about "developing an ability to engage with, and

participate in, a particular environment" (p. 25). The environment, with all its

accompanying artifacts including people and gestures, should be used as a mediational

tool for understanding development in the L2. Donato (2000) explained:

> One important lesson of sociocultural theory that we learned is that learning and
>
> development, including foreign and second languages, is situated. Situatedness means
>
> that learning unfolds in different ways under different circumstances. The
>
> circumstances include the specific concrete individuals each with their different
>
> histories, the signs they use, and the assistance they provide and are provided" (p. 47).

An example of situatedness concerning gesture and SLA can be seen in McCafferty

& Haught (2008). In this study, six adult ESL students from Japan, Korea, Russia, and

Belarus were beginning English learners. In this particular ESL class, drama was used as

a strategy to improve their speech production and listening comprehension. Students were given tasks such as theater games, improvisations, tongue twisters, and dramatic scripts to rehearse. Students were filmed while they took turns assuming different roles with John their teacher. After viewing their acting on TV, the students asked John to model certain prosodic features of the language in the script. John modeled intonations, gestures, asking questions, and other utterances, demonstrating mimetic forms of communication. Students then rewrote their scripts and would often ask John to model the adjustments that they created.

The researchers found that the students were able to unite aspects of language and culture when they were made aware of it through viewing themselves and John. Through their construction of the drama and imitation of John, students demonstrated their growing understanding of the script and American culture. Eventually, gestures and language began to synchronize in more mainstream American fashion. In this case, imitation proved to be a transforming aspect of teaching and learning in relation to the use of drama in the classroom for all the participants. Students created their own ZPD and had John model his interpretations of what they created.

Demonstrating a Vygotskian approach in the classroom, students were part of the construction of their own learning. This enabled the teacher and them to realize where they were deficient in their knowledge of English as a language and English/American culture, or basically what Agar (1994) refers to as *languaculture*. They were able to practice in a highly contextualized and social nature that promoted languaculture and were able to display what they learned. They were able to see the differences in their drama/play from where they started on their own and where they were with their

teacher's assistance. This demonstrated Vygotsky's theory of learning leading the development process. Results highlighted the importance of imitation, play, and especially that embodiment was a large part of the act of becoming in a second language. The researcher's use of drama-type activities opened the second language learning up to the notion of play by the students.

Vygotsky (1978) addressed play and gesture stating, "Children's symbolic play can be understood as a very complex system of 'speech' through gestures that communicate and indicate the meaning of playthings" (p. 108). This process may be particularly significant for second language learners. They often produce a practice of translating information through their L1, which is a complicated and cognitively challenging process (Lantolf & Thorne, 2006). It is possible that if one has space to continually play with language with interlocutors and with themselves, through inner and private speech, thinking in the L2 may become fluent. Language play may create a foundation for consistent and reliable speech production and provides an effective tool for language use in context (McCafferty & Haught, 2008).

McCafferty's (2002) gesture study provides an example of flexibility in language based on an intermediate L2 speaker that used iconic gestures while in conversation. Whereas other research (Gullberg, 1998; McNeill, 1992, 2005) explains how gestures fill in gaps, such as lexical searches, during language struggles, McCafferty found that his L2 learner used gestures while experiencing no real linguistic difficulties in the discourse. Gesture production between both participants did provide clarification and repair tools for the linguistic speech as previous studies have shown. However, in this study, the L2 learner's use of gestures was not limited to fixing discordances; he also deployed iconic

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gestures to help convey contextual meaning. As an intermediate student, the L2 learner

spoke with less hesitations and abruptness but used a large amount of iconic gestures to

provide more concrete and precise information in the dialogue. As a result, both used

gestures that were produced by the other interlocutor demonstrating "uptake" of each

other's meaning. The use of gestures and the materialization of thought and speech

allowed and encouraged the transformation of knowledge to occur.

McCafferty (2002) also found that the natural setting for the conversation increased

engagement and motivation between the participants. The setting for the conversations

were casual in that the participants selected the rooms, lounges, or outdoor areas where

they could talk comfortably with little worries about lab equipment, observation

windows, or other experimental procedures. Besides the use of a camera and microphone,

they were given the liberty to establish as natural a setting as possible. This included the

freedom to speak about any topic, which avoided any constrained structures that occur

with question-and-answer type surveys or interviews. McCafferty articulated that the

naturally situated context of the conversation produced a heightened focus on meaning-

making for both participants.

Overall, the mediational value of gesture proved to be a materializing vehicle for both

interlocutors to overcome language barriers. McCafferty (2002) concluded that gestures

were serving intrapersonal purposes, such as inner-speech, to support the participant's

thinking and orchestrate a more coherent dialogue. In addition, the L2 learner

demonstrated evidence of appropriating new concepts through gesture that were not a

part of their L1 culture.

Concerning interpersonal communication, McCafferty (2008a) proposed that imitation and mimesis might be at the heart of learning a second language by providing a foundation from which to add other language components. In this theoretical piece, McCafferty began with the proposition that SLA research would benefit from a broad, comprehensive approach to language in natural contexts. He claimed that gestures as mimesis, are material carriers of meaning, which assist in thinking and communication. He also explained that mimesis may be a central component to understanding one's identity in the second language.

McCafferty and Rosborough (ISCAR, 2008) found that gesture as mimesis was a foundational aspect of communication between a NS and NNS where foreigner talk (FT) was employed. They found that mimetic gestures created a foundation for comprehension that often anticipated and proceeded verbal speech production. Although mainstream SLA researchers would term this simply as comprehensible input, the production of mimetic gestures created a social situation, atmosphere, and stage, which was not only comprehensible but created new and shared meaning in the dialogue. The flexibility that mimesis affords both participants moves beyond a focus on comprehensible input that is the foundational basis for most second language models, protocols, or programs in the educational system.

In McCafferty and Rosborough (ISCAR, 2008) findings showed that the participants did not necessarily rely on words to make meaning in key moments of the highly social constructed dialogue. It was mimesis and gesture between the interlocutors, on the physical plane, that produced an imagistic setting for understanding. In one example, the NS and the NNS turned to a complex development of gesture to communicate abstract

content based on Taoism. The findings departed from traditional defined FT which contain a "here-and-now" orientation, and other characteristics such as: simplified discourse, narrow topics, abrupt shifts, and multiple comprehension checks (Ho, 2005; Mori, 2004; Shamoosi, 2004; Tsang, 2004; Wooldridge, 2001; Wu, 1993; Yano, Long, & Ross, 1994). Instead, by studying gesture's role in discourse between the participants microgenetically, McCafferty and Rosborough were able to see that mimetic gestures rose in times of discourse challenges, which provided a concretization of meaning for both participants. In addition, the embodied imitation produced through mimesis allowed both participants to consciously own the meaning and create a dialogue that would not be completely available through the speech channel.

Mimesis thus provided the participants with a concretized tool, which promoted social transformation and language development. Although many L2 gestures are culturally based and often accompany the learning of an L2, it is evident that the mimetic qualities of gesture displayed in McCafferty (2002) and McCafferty & Rosborough (AAAL, 2007; ISCAR, 2008) demonstrated that both participants were able to have a more direct link to the images they shared in the discourse. Unlike traditional FT studies, results demonstrated that the NS did not necessarily take the lead in displaying gesture in a model form but showed that both participants were able to mimetically display their thoughts and the direction of their thinking process in the discourse with the other participant borrowing the gestures to display sense and meaning. Overall, mimesis as a component of communication and understanding meaning played a fundamental role in clarifying, concretizing, and providing a foundation for communication that was instigated by both parties during discourse.

Gesture, SCT, and the L2 Elementary Classroom Setting

Sociocultural research seeks to study the mediated mind in the various ecological sites where people engage in everyday living. The L2 classroom plays an important role in the lives of children and is an authentic context for learning a second language (van Lier, 1996). van Lier described authenticity as a "process of self-actualization, intrinsic motivation, respect and moral integrity in interpersonal relations" (p. 125). According to this view, authenticity in the L2 classroom is not found in the product or property of the language but is part of the process of validation by the participants.

Jacobs, McCafferty, and DaSilva-Iddings (2006) explained an SCT view of the classroom:

> Therefore, in regard to L2 classrooms and cooperative learning, socio-cultural theory emphasizes the social nature of learning, that symbolic, physical, and mental space are mediated through interaction in cultural-historical contexts. Students utilize themselves (their own histories), each other (as in groups), artifacts (especially language and other forms of communication), and the environment in their efforts to make meaning of and in the L2 (p. 23).

An SCT ecological approach to learning a language encompasses the notion that all artifacts and the context are relevant and part of the "affordances" provided for learning a second language. Gesture plays an important role as an artifact that has consistently been found between humans of all cultures, including the elementary classroom.

However, as of this time, there are no studies concerning second language learning and gesture, in use, as a mediational tool for learning at the elementary classroom level. As mentioned in previous sections, many studies have been produced concerning SLA

and gesture using other theoretical frameworks. The majority of these studies have been quantitative and based on interpersonal communication functions. A number of studies demonstrate an SCT approach to understanding SLA through the analysis of gestures and speech in language (Choi & Lantolf, 2008; McCafferty, 2002, 2006, 2008; Negueruela, et al., 2004; Negueruela & Lantolf, 2008; Sime, 2006, 2008). The majority of these studies are based on adult students with McCafferty's work on gestures situated outside of the classroom using adults at the university level.

Of particular interest, Sime (2008) found an impressive correlation by language diverse learners when viewing and interpreting emblem and deictic gestures. She found:

> although learners differ in their language-learning beliefs and strategies, they share some strategies of gestural meaning-making. These shared strategies are even more prevalent when it comes to gestures used in direct relationship with language-learning processes, being thus special attributes of classroom interaction (p. 276).

It is possible that gesture contains characteristics that are flexible and ambiguous enough to meet the intercultural needs of diverse students. It is also possible that gesture as image in thinking, is more readily accessible to SLLs than speech.

Implications of Gesture, SCT & the L2 Elementary Classroom

An SCT approach to teaching and learning a second language allows for an internal process to be made external. Research with children in the L1 classroom has shown that gesture assists in memory, cognitive growth, and development (Goldin-Meadow & Wagner, 2005; Goldin-meadow, 2003; Roth, 2002; 2003; Roth & Lawless, 2002) In addition it has been identified as highly effective when it is performed specifically to provide additional information not carried by verbal speech (Cook & Goldin-Meadow,

2006; Singer & Goldin-Meadow, 2005). It is possible that if gesture is viewed as a simple repeat of a message; albeit in another mode, it may only act as a reinforcement of the object or topic. This follows Vygotsky's (1987a) description of the associative complex learning processes of children. According to Vygotsky an associative practice, such as gesture and speech sharing a similar meaning, results in a concrete and foundational process for learning and gaining a basic knowledge of an object. However, this only accounts for the beginning process to gaining a higher conceptual function of the object or sign. He argued that without mediational use of the sign, simple communicative repetitive reinforcement of the sign and its associative complexes do not provide children with internalization, development, and self-regulation of cognitive functions.

SCT-framed research concerning SLLs takes into account their cultural and historical backgrounds, their current contexts, and their identities. Gesture plays an important role in meaning-making as a physical and symbolic tool. It is essential to look at gesture as image as a part of embodiment, integral part to understanding the basic units of meaning (Maran, 2003; McCafferty, 2008b; Roth & Lawless, 2002). Research in L1 and L2 classrooms and other contexts have demonstrated gesture's role in communication, affect, and cognitive development. Gesture as a tool is an ever present artifact both inter- and intrapersonally and needs to be considered in understanding how people develop including the young elementary child.

Vygotsky (1978) explained, just as physical tools are created by humans to control and change their physical environment, so symbolic and psychological artifacts, as auxiliary means, empower us to learn and develop. A number of works have extended his psychology of learning theories and gesture work to including older children, young

adults, and adults[3]. However, the role of gesture, as an artifact in the ecology of an early

L2 elementary classroom needs to be more thoroughly explored as a mediational tool for

meaning-making, to understand its role for meeting the needs of second language

learners.

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[3] Givry & Roth, 2006; McCafferty, 1998, 2002, 2008a; Negueruela, et al., 2004; Negueruela & Lantolf, 2008; Roth, 2001

CHAPTER 4

METHODOLOGY OF THE STUDY

Using a Vygotskian Sociocultural Theoretical framework, this study probed the use of

gestures by a teacher and students in a sheltered English language learning elementary

classroom. The purpose of this study was to explore how gestures were used as

mediational tools for teaching and learning a second language. Although previous studies

have explored the use of gesture and second language learning in the classroom (Faraco

& Kida, 2008; Lazaraton, 2004; Sime, 2006, 2008; Zhao, 2007) this researcher was

unable to find studies conducted on the use of gesture as a mediational tool for teaching

and learning a second language at the elementary level from an SCT perspective.

Differing from mainstream educational views of gesture's form and function in the

classroom, this study placed the analysis of gesture as a fully integrated part of language

and communication for the understanding and interpretation of meaning-making in an L2

setting.

Research Questions

The guiding questions for this study were:

1. How does the use of gesture operate as a form of meaning-making for both

teacher and students in a second-grade, sheltered English classroom?

2. How does the use of gesture mediate learning of the second language?

Research Design

Qualitative Perspective

To answer the research questions, a qualitative methodology was employed. Qualitative methods entail a form of inquiry for understanding social phenomenon that includes characteristics such as gaining the participants' perspectives or emic view, having the researcher as the primary instrument for data collection and analysis, usually involving fieldwork, and primarily employing an inductive research strategy (Merriam, 1998). Qualitative studies are often undertaken as a result of inadequate or limited explanations in theory to account for certain phenomenon. Qualitative research uses an inductive approach, which allows the researcher to gather data in context. This affords them the opportunity to observe and record understandings and meanings people have constructed in their social world.

Concerning the use of gesture in teaching and learning a second language, a qualitative methodology was necessary to capture context, personal interpretation, feelings, and experience within the situation. As discussed, Vygotskian theory states that a person's history, culture, and current context play a central role in the learning and development. van Lier (2004) described this role as "ecological". He explained:

From an ecological perspective, all communicative acts in a learning environment have multiple reasons, causes and interpretive potential, depending on all the relationships between and among all the participants in the setting, as well as the evolving setting itself. In this way it can be said that the pedagogical setting is an ecosystem, embedded in other ecosystems along different temporal and spatial scales (p. 10).

The research questions of this study called for an understanding of a classroom's

collective and individual meaning-making experience with language, communication, and social contexts. A qualitative methodology was employed to answer them. To specifically answer the to two questions, data was collected by video recording and observation of a teacher and students' speech and gesture in their classroom setting in the Spring of 2009. I also interviewed the teacher after the classroom data collection in the Summer of 2009. Specific logistics of video recording hours, days, including classroom schedule, are delineated in chapter five.

Data Sources

Data sources used for this qualitative study were the following: (1) audio/video taped teacher-student and student-student interactions, dialogue, and work during class, (2) field notes were taken in class to supplement and identify particular points of interest for further analysis of the video data, (3) classroom assessments, including English language assessments were obtained, (4) two post-classroom observation interviews with teacher. The rationale for each of these data sources is delineated within the procedures section for data collection.

Procedures

Classroom Videotaping

Classroom interactions between the teacher and students were videotaped using three video cameras. Two cameras, cameras two and three, were placed in the corners of the room to provide wide angles to capture face-to-face interactions between the students and between the teacher and students. A third camera, camera one, was placed on a monopod. This camera was mobile, allowing a primary focus on the teacher and a secondary or tertiary angle of the classroom interactions as seen from the other cameras' viewpoint.

The monopod was used as means of stabilization, mobilization, and to conform to the space limitations found in the classroom. The teacher wore a wireless microphone hooked with reception capability to the stationary cameras in the corners of the room. The mobile camera microphone was also used for reception. Occasionally, when the teacher was not a part of an interaction, a second wireless microphone was placed near the student-to-student dyad. This microphone was synchronized to the corresponding camera videotaping the students.

I operated the camera during the videotaping. As a result, the cameras and I were a new addition to the eco-social space in the classroom. The role of the researcher was as an observer but some dialogue ensued as a natural result of being a part of the classroom. At times, the students and teacher initiated questions or brief conversations with me, which resulted in my voice being a part of the videotaping. In addition, I was often observed in the background of one of the two stationary cameras while filming with the third camera. These forms of participation in the classroom were minimal and a result of having to obtain the data. My interactions were casual and it was hoped that a minimal amount of participation would lower the *observer's paradox* (Glesne, 2006) of having me there. In these minimal interactions, no strategies, techniques, artifacts, or experiments were performed between the students, teacher, and me. Any videotaped participation by the researcher was minimal and based on simple interactions according to the needs or requests of the situation.

Altogether, 28 full days were recorded for a total of 131 hours. Video recording lasted for four and one-half hours every Monday, Tuesday, Wednesday, & Thursday, which were the days students left the classroom for what the school colloquially call

"Specials". Specials was an hour long class where students worked with another teacher in another classroom in subjects such as art, music, P.E., and library reading time. Fridays the students did not have Specials, which resulted in five and one-half hours of video recording. Each camera recorded approximately 131 hours each; although, much of the footage overlapped in recording the same data, albeit differing angles. Depending on the camera, day, and activity, usually two cameras viewed similar activities during the day. At times, all three cameras viewed all or some of the same activity and participants[4]. There were also hours where only one camera captured certain participants' activities while the two other cameras viewed something different. Hence, a total of 393 hours of data were collected, with 380 hours being observed first hand and 70 hours of recordings reviewed for analysis.

Videotaping and Field Notes Rationale

In addition to capturing displays of gesture, videotaping elementary school students' responses in context was necessary because of the limited consciousness or awareness children tend to have concerning the psychological states displayed by others (Brown, 2007). Children at this age are able to reflect on past experiences and share narratives but are more focused on the present (Vygotsky, 1987a). Asking seven or eight year old children to recollect lessons, motives, discussions, actions, and their psychological states at the end of the study, in relation to the gestures they used, even when using videotape, may not elicit as pertinent information as capturing performance in the moment.

Field notes were taken during the videotaping to provide additional context and information during the analysis of the video. Notes concerning gesture covered topics such as the subject being taught, the activity performed, time of day, and themes of day

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[4] See Appendix C: Classroom Layout

or week at school. At times, gestures that seemed more relevant or taking a leading role in communication challenges were recorded and highlighted for future analysis. Field notes were a secondary source of data as the primary focus of time and observation was through my use of the mobile camera and moving it in correlation to the teacher's movements in the classroom. However, notes and coding marks in the classroom did assist in identifying some gesture patterns during the post-data collecting analysis phase.

Classroom Records and Assessments

Classroom records and assessments were viewed to gain a background understanding of the students' educational experience and English history. Student history records reviewed included information that displayed their full names, country of heritage, primary language used at home, years in the U.S. and U.S. schools, literacy level in their L1, and current reading level in English. Records specific to only this school year's English educational experience included reading levels, comprehension levels, instructional levels, progress scales, and spelling stages. The teacher implemented an ability-based grouping strategy for language arts subjects, which were color-coded for organizational purposes. These color-coded groups were also noted as an indication of a students' English level, which were clearly posted on the wall near the teacher's reading table. Since some gestures are emblematic with meaning tied directly to a person's culture, knowing the students' background allowed me some insight into specific gestures and meanings.

Recorded Teacher Interview

After the classroom data collecting was over, I met with the teacher in two separate interviews to review pre-selected scenes from the videotaping. These interviews were

audio-recorded and consisted of two parts: general questions concerning gesture and questions specifically correlated while observing the video data from the class. These interviews lasted approximately two hours each with the majority of time spent viewing and discussing video clips. The interview questions were written and divided into three sections. The first section covered general teaching background issues; the second covered teaching, communication, and pedagogic practices including her opinion, observation, and use of gesture and nonverbal communication; and the third section was specific to the video clips being viewed (see Appendix D).

At the beginning of the first interview, the teacher was asked to express her thoughts on gesture and was then apprised of the purpose of the research. The questions regarding the viewing of the video clips were used as a guide to begin the conversation but were not followed in a strict linear fashion. I wanted the teacher to comment freely on the situations between her and the students without too many constraints on her ability to reflect on the video. The problem with using highly structured questions is that they tend to elicit responses to the investigator's preconceived notions of the world (Merriam, 1998). However, given the focus of this research, questions specific to gesture and meaning-making were initiated to maintain the context of the study. The audio-taped interview was transcribed and serves as additional data not provided in the video recordings.

Data Analysis

Microgenetic Analysis Background

Vygotsky (1978) argued that a genetic method of viewing learning and development is the only way to understand the inner workings of acquiring higher mental functions. Genesis, in Vygotskian terms, has to do with culture and history and the mediational role they play in constructing higher forms of thinking. Higher functions are historic, meaning that they are constructed or developed through participation with the social world (Daniels, Cole, & Wertsch, 2007; Lantolf & Thorne, 2006; Vygotsky, 1978, 1981; Wertsch, 1985, 1991).

A microgenetic approach to analysis focuses on the process of development over short periods of time. It allows for the examination of social and individual activities from its genetic roots onward. Microgenesis is associated with the observation and explanation of an event or activity that is being transformed by some meditational tool or means, including people, which in turn influences the transformation of the individual's potential to further the activity ontogenetically (Wells, 1999). In this type of analysis, a primacy is placed on problem-centered learning and the documentation and explanation of the process of persons being pushed beyond their self-regulated abilities.

The main point of this analysis is that a causal-dynamic relationship of psychological functions can be identified and explained when viewed during the emergence of the psychological process, thus avoiding the fossilized, automatic forms found in the self-regulated product. In this regard one can understand the inner workings of the phenomenon and avoid a "postmortem" method of studying human development (Lantolf & Appel, 1994). The inner workings and causal dynamics of development can be seen

through the mediated use of culturally constructed semiotic artifacts and sociocultural practices. In this psychology, imitation, the process of making a function one's own, begins in the physical, socio-cultural plane. Tools, including symbolic, psychological, and physical, are used as auxiliary means to control their own thinking and eventually internalize a process, which leads to development and transformation. In this sense, all mediational aspects of discourse, including nonverbal features such as gesture, should be analyzed and not just the speech between teacher and learner.

Data Analysis of Gestures in the Classroom

Gesture was viewed as one of many affordances available in the eco-social environment of the classroom. In an eco-social perspective, the setting and any semiotic affordances found therein are potential tools for making meaning. In following a genetic method approach, observation, video recording, note-taking, transcriptions, interviews, and review of the video allowed for the capability of following the construction or birth of gestures *in-vivo.* Analysis of video recordings allowed for the viewing of the emergence and germination of the teacher and students' gesture forms in second language (L2) meaning-making. Specifically, multiple cameras were used daily to record evidence of communication and meaning-making that would not be available from the single perspective of one observer. Camera 1 was mobile and represented my position and perspective; however, the other camera's provided additional insights unavailable from my vantage point. Post-data collecting analysis included the viewing of camera 1 clips as well as viewing Cameras 2 and 3, which often provided the perspectives of the teacher and students. An observation log journal was kept during daily observation and after-school. This journal included entries specifying when gesture production appeared to take

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the lead in activities or supply information not readily available in any other modality at that time in the classroom task. Times were noted and a selection of video days, hours, and activities were based on observation and observation field notes. After reviewing selected clips, the previous and post times of the particular gesture production, activity, and subject were also reviewed. To better understand the genesis of the activity, the entire day's recording was reviewed and in some cases previous and future days were also reviewed for related meaning-making processes to the selected scene. Transcripts were made of the scenes and categorized for related themes. After categorizing the gestures and scenes, selection was made according to the centrality of gesture use in the scene. Chapter five provides further detail on the selection process and organization of the video clip findings.

Transcriptions and coding of their gesture revealed descriptive accounts demonstrating the complex process of teaching and learning a second language. One complexity in the observation and analysis of the gesture productions was the difference in function between interpersonal and intrapersonal purposes. Gesture can represent and take the form of both internal and external thought processes. Interpersonal gestures were analyzed for their joint-sharing potential, communication constructs, and ability to overcome communication challenges. Intrapersonal gestures were also analyzed as affordances for creating communication and overcoming language challenges. In summary, gesture was analyzed as a social practice for its potential to provide the teacher and students mediational affordances for communication and overcoming second language learning challenges.

Ecologically, gesture was viewed as a meditational tool and semiotic affordance for its ability to hasten the emergence of change in the teaching and learning activity in the classroom. Mediated learning and teaching is viewed in its activity bound to social actions in the ecology of the engagement (Scollon & Scollon, 1998, 2001a, 2001b). The gesture's form and function was influenced and related to the context of the situation. An eco-social approach in the analysis allowed for the viewing of the participants intrapersonal and interpersonal intentions, interests, feelings, and ideas, which often transcended both L1 and L2 speech challenges. Hence, a focus on the microgenetic process of meaning-making in L2 teaching and learning through gesture in the eco-social setting was analyzed. The focus was not on any one specific activity or form of social communication but on gesture as a mediated action in process and as a source for meaning-making.

Transcription

Coding of the transcriptions include both the speech and gesture of participants. Pseudonyms are used throughout this study for participants and the schools name: *Valley Elementary*. The teacher is addressed as Mrs. Dee or *T*. The students have been designated with an *S* and assigned a numerical number such as S1, S2, S3 and so forth. The student number remains consistent throughout the study.

Gesture including speech was transcribed using a variation of McNeill's (1992) verbal/gesture method (see Appendix B). Specifically, five gesture types as classified by McNeill were used in the analysis of the classroom activities: beats, iconics, deictics, metaphors, and emblems. The stroke phase of the gesture was also viewed for any additional clarity or meaning it provided to the situation. Strokes in gesture often

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anticipate and synchronize in a unified process with the most salient points of speech. The stroke is often centered between a preparation movement and a retraction movement. The entire gesture movement may be significant or at times only the stroke may be carrying a message (Kendon, 1994; McNeill, 1992). The inclusion of the entire stroke phase was decided on an individual gesticulation basis depending on the context and situation. Gestures that were asynchronous to speech were also analyzed for their content and purpose in meaning-making. How gesture carried and supported meaning-making between individuals in the classroom was the focal point of the transcription analysis.

ELAN and Quicktime software was used to view and create transcripts. Both softwares allowed for a video window to be displayed while also having a text format to transcribe speech and actions. They also provided a means to adjust the speed of the video, which allowed me to capture both speech and gesture movements that were not as readily identifiable in real time. The video recording and written transcription provided a data format that could be coded and categorized for meaning-making in interpersonal and intrapersonal dialogues, narratives, instructions, and other utterances.

Setting

This study was performed in a sheltered English second grade elementary classroom located in a large southwest U.S. city. The school is located near the urban center of the city and qualifies as a Title I school. This site was purposefully selected for its function as a sheltered-English classroom in a full-immersion based school. Placement decisions by administrators and the teacher purposefully grouped students in this class based on their abilities and experience with English as a second language. Sheltered-English

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programs often consist of English Language Learners (ELLs) from different linguistic

backgrounds that come together to receive content and English instruction especially

designed to support the needs of non-native English speaking students. This program

paralleled other "mainstream" classroom curriculum being required to use similar

educational programs and assessments. The classroom was "sheltered" in that all

students were ELLs and the lessons were prepared with this population in mind. Having

multiple years of ESL teaching experience, the teacher employed many standard

modification and accommodation strategies in her lessons such as the use of image,

objects, kinesthetic, cooperative, and teacherese[5] approaches. The characteristics of this

program met the needs of the study by allowing the observation of second language

teaching and learning.

Daily Schedule

Similar to most elementary schools, *Valley Elementary* followed a basic daily pattern

of subjects and curriculum. This second grade classroom was no exception. The average

day contained the following schedule (Table 4.1):

Table 4.1

Daily School Schedule

Time	Subject or Activity
8:50-9:00	School and Class work begins – students work on computers and other assignments
9:45	Class is brought together for instruction on daily schedule, jobs, and objectives
10:00-11:50	Class reading, Group and individual language instruction (reading, spelling, writer's workshop, reading workshop), and Stations performed with partners, small groups, individuals

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[5] Teacherese refers to the shift in verbal register by a teacher from their usual speech to one specific to the needs of school or the classroom. Teacherse is similar to motherese or foreigner talk, when a change in register is made in an attempt to communicate with a specific person in a specialized context.

11:50-12:30	Lunch
12:30-1:30	Math Instruction
1:30-2:20	Specials – Music, P.E., Art, Library depending on the day
2:20-3:00	Extended time for subjects as needed (language arts, math, and/or science and art projects)
3:00-3:15	Finish projects, usually science, oral reading, and closure to class; walk students outside

Participants

Teacher

The teacher in the classroom was a female monolingual English speaker with 19 years of employment as an elementary educator of which 17 years was as an ESL instructor. She has a M.A. in education and a Teaching English to Speakers of Other Languages (TESOL) certificate. Her M.A. thesis emphasized literacy and interaction. Specifically, her study provided insights into the positive effects on comprehension when reading and discussion were intertwined activities. She reported that her interactive reading study was the basis for her teaching style. She described her teaching philosophy as being based on allowing the students to promptly question and express their understandings and experiences with the subject at hand. She rarely made the students wait for stories, instructions, announcements, and such to be completely finished before taking questions or comments. As a result, her philosophy conveyed to the students an ownership in their classroom processes.

Although she is a self-reported monolingual English speaker, on occasion she spoke Spanish or asked for Spanish words for assistance in communication challenges between her Spanish-speaking students and parents. English was by far the predominant language

used in the classroom by this teacher, which resulted in communication challenges between her and the students.

The teacher estimated that she has had around 12 different language-speaking students in her classroom experience. In addition, for one year, her class consisted of a combination of ELLs and hearing-impaired students with cochlear implants. These students could hear by way of the implants and there was no formal sign language used; however, the teacher reported that nonverbal behavior was an important means of communication.

The teaching experience of this instructor was rich in working with minority language speakers. This provided her many opportunities to use gesture as a form of communication to overcome miscommunication. Indeed, it is possible that her experiences emulate Gullberg's (1998) findings where gesture increased in correlation between the amount of interaction between native speakers and non-native speakers. The teacher's position, as a predominantly monolingual English teacher of ELLs, provided a similar relationship.

Students

The child participants were 19 bilingual speaking students. A number of students were recent immigrants to the U.S. and all students have been identified and labeled as limited English proficient (LEP) by government standards. The languages spoken in the classroom are Spanish, Bengali, Arabic, and Tagolog, with Spanish being the predominant language. The class consisted of 18 students in the morning until a Filipino student joined them after lunch for half of the day. The selection of these children was appropriate for this study. Although this study could have been performed with only two

different languages spoken in the classroom, a multilingual classroom provided a range of language challenges for both teacher-student and student-student interaction.

Researcher

As the researcher in this study, I describe my language background as a fluent English speaking Italian male attending all school grades in the U.S. I was raised in a bilingual home and I have taken multiple courses of Italian at the university level. In addition, I continue to use Italian at a conversational level.

I am completing my Ph.D. in Education with a TESOL emphasis. I have a M.A. degree in Applied Linguistics and a B.A. degree in Anthropology and Education. As an educator with eleven years of experience, I have worked in elementary, secondary, and adult classrooms. Although the majority of my experience has been with secondary and adult second language learners, as an educator by profession, I believe I participated and engaged appropriately in the social context of the elementary classroom.

Researcher's Role

My role in this qualitative study was as an observer; however, my presence in the classroom placed me in a minimal state of "observer-participant" (Glesne, 2006). Glesne described that direct participation with the participants provides a greater opportunity to learn from them. She cautions that a paradox develops as participation may actually decrease the level of observation. A primary focus on observation of teaching and learning in the classroom was performed; however, at times some interaction between the teacher, students, and me occurred. With an eye towards not being aloof or distracting in the ecology of the classroom, my presence and protocol required that I interact with the students and teacher to answer questions, reply to comments, and be a part of the

classroom community. I remained cognizant of this situation and acted first and foremost as an observer researcher. However, I remained open to the possibility that children at this age would want to interact with me since I was a part of the ecology of the classroom. As a result, I established a friendly relationship and engaged in dialogue as the need and opportunity required. I made a concerted effort in viewing activities performed by individuals but at the same time, I also kept an awareness of the context of the larger classroom experience in which the emic experience is embedded. Spradley (1980) described this precarious situation when he stated that a researcher should try not to take things for granted and that they must maintain a "dual purpose" (p. 58). A part of this situation included that I kept my engagement in the classroom process to a minimum. Some specific standards recommended by Spradley that I followed are:

1. Be explicitly aware of things that others take for granted

2. Take mental pictures with a wide-angle lens

3. Be aware of experiencing feelings of being both an insider and outsider simultaneously

4. Engage in introspection to keep a record of what you see and experience

5. Keep a record of what you see and experience

I followed these standards by including a journal describing observations and containing reflective notes concerning the classroom context and my own teaching and learning biases.

Validity and Reliability

Validity and reliability issues are important aspects to consider and discuss before, during, and after the data collecting time period. I implemented the following procedures to support the validity and reliability of this qualitative study:

First, I spent 28 days of filming with four previous visits to the classroom for association and observation purposes; one final day of "celebration" to show students a slideshow of their activities; and post-data collecting interviews with the teacher. This time period covered approximately one quarter of the classroom year, and assisted in developing trust, understanding atmosphere, and learning about community practices of the classroom. The use of persistent observation helped ensure that the data collected was more closely aligned with the typical classroom day and not a demonstration or "show" for the camera.

The data collection procedures employed a variety of techniques to provide a triangulation of perspective. As stated previously, this triangulation included the use of multiple video cameras, observation, field notes, a reflection journal, and two interview and video viewing sessions with the teacher. In addition, I have reviewed select portions of the video data with my advisor and other professional educators to obtain additional input and reflection concerning my interpretation of the data.

CHAPTER 5

FINDINGS OF THE TEACHER AND STUDENTS' GESTURES

Within this chapter, I will present findings from the study based upon video recorded and observation data of a sheltered-English language second grade classroom. The chapter is organized into four sections: introduction, research question one, research question two, and summary of findings. The introduction section contains the following sub-sections: Overview of findings, overview of interview, and a selection from the random sample scene.

The first section in the introduction is a general overview of findings. This section begins with a general description of how class commences on a typical daily basis. The overview highlights the significant findings selected and how they are categorized in relation to research questions one and two. The interview data explains the teacher's general disposition and view concerning this particular classroom experience, general teaching philosophies and approaches and her view of gesture use in the classroom. In addition to the quotes and themes demonstrated in the interview sub-section, additional interview data are presented in relation to the research question findings in sections two and three. A random sample scene follows the interview subsection in the introduction. The purpose for this randomly selected scene is to demonstrate the extensiveness of gesture's function and use as a typical and consistent part of communication processes in the classroom environment. The randomness of the selection represents and illuminates the pervasive occurrence and milieu of gesture in most tasks and activities in any given day of the classroom.

The second and third sections of the chapter are organized around the two research questions. The last section provides a summary review of the findings in this chapter. Its purpose is not only to recap the findings but also provides a lead into chapter six concerning the value and implications these findings have for communication, meaning-making, second language teaching, and education as a whole.

Findings Overview

Understanding the Demands of Communication in the Classroom

The start of each day commences with interpersonal communication between the teacher and students. Although students have an understanding of the basic classroom schedule, their lives and needs are different on a daily basis. Despite the established pattern for procedures and work, the perceptions and intentions of the students are consistently changing, providing new interpretations for how to proceed and accomplish tasks. In the search for communication, understanding and new meanings, the teacher and students employed a variety of gestures to accomplish their school tasks throughout the day. A variety of "unexpected" or "unplanned" communication, such as family stories, physical ailments, and emergencies to accomplish an assignment cannot be explicitly included in a lesson plan. The demand on language to explain concepts beyond the expected vocabulary level or school assignment is time consuming and dynamic. The teacher and students find themselves in a challenge to communicate ideas about the realities of the world they are facing. Their search for meaning takes their communication beyond the bolded words, fill-in-the-blank, or concept diagrams often used in second language learning models. Gesture plays a pervasive role in developing meaning and

communication in both the planned and unplanned classroom work. The reliance on gesture as a meditational tool for meaning-making was richly demonstrated in the data collected.

In chapter three, studies based on gesture, analyzed its multi-modal functions for overcoming language challenges, depict concrete ideas, develop abstract ideas, index emphatic points, assist in memory retention, access past knowledge, and develop new constructs and knowledge. In this study, a variety of diverse gestures were displayed throughout the 28 days of observation and recording. The classroom activities and dialogue selected for analysis are examples and scenes representative and indicative of multiple and similar data findings throughout the study (see Appendix A). Findings in this chapter focus on particular scenes containing rich points of communication. As a result of language's ability to contain and send multiple messages and meanings, some scenes and activities provide examples in a variety of categories.

The teacher and students displayed all gestures as categorized by McNeill (1992) such as: iconic, metaphoric, beat, pantomime, and emblematic/Italianate[6]. The focus of this study is on the role of gesture in holistic meaning-making processes between a teacher and her students in a second grade classroom ecology. Gesture coding focused on providing descriptive movements based on the positions and projections of the hands, fingers, and arms. Brackets around transcriptions of verbal speech have been provided for speech-gesture coordination. Although this coordination is not coded for onset and end

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[6] Iconics depict a concrete object or event and bear a close formal relationship to the semantic content of the speech. Metaphors as iconics in that they are representational, but depict abstract ideas and are not as concrete. Deictics or indices point to something or someone either concrete or abstract. Haptics are similar to deictics but differ in that there is actual touching of the object. Beats refer to the up/down or in/out movement of a hand that indexes the word or phrase it accompanies as being significant. Emblems/Italianate are deliberate and standardized movements that have a direct verbal equivalent known to others in the same speech community. Typically these movements continually demonstrate the same meaning when performed. The above gesture categorizations are not necessarily segmented or individually performed but may overlap and occur concurrently.

phase, the stroke phase is marked for its emphasis in meaning. This modified gestural transcription is sufficient to meet the description needs of the study. A general description of the trajectory, shape and location of the gestures is provided in the examples. Information about the transcription convention can be found in Appendix B.

Meaning-making gestures played an important role in the shared processes between the teacher and her ELL students. Results from this data indicate that gesture was used as referential signs for joint-attention, interpersonal and intrapersonal communication, vocabulary and content development, and transformation of activities. In addition, gesture was consistently used as a means to overcoming language challenges such as lexical needs between the teacher and students. Many gesture productions were initiated by the students and reproduced by the teacher for pedagogical and communication purposes. The students reciprocated this pattern; they also mirrored the teacher's gesture and embodied instructions. As a result, findings show that gesture was often central in collaborative and meaning-making searches between the teacher and students. The search for overcoming language challenges through the use of gesture, resulted in a transformation of the learning and teaching task. New activities, definitions, and perspectives were produced when the teacher and students turned to gesture and embodied messages to find meaning in their school tasks.

The gesture data for this chapter were purposefully selected for their influence on assisting students with language driven concepts in the classroom. The data provide evidence of the gesture types produced, the meaning that was made between teacher and students, and demonstrates a descriptive account of the multiple forms of gesture materializing in the daily routine of the classroom. Although it would be impossible to

completely identify and categorize every gesture performed during this study's time period, a group of gestures were selected for their pervasive or significant role in meaning-making between the teacher and students. People can produce gesture and other non-verbal communicative messages at a considerable rate in a social setting. In this classroom, there was no activity, subject, or task that did not include gesture as a part of the meaning-making experience. The gesture examples highlighted in this chapter were selected as samples that answered the research questions and contained a variety of functions and uses for the participants in the classroom. These selections came from a thematic-based coding of the gestures that heighten and produced rich meaning for the teacher and students. Appendix A provides a chart containing the gesture functions selected, the day and time they were performed, topics or content reference for organizational purposes, and the subject or setting in which it took place. Selections from the analyzed data used in this chapter have been placed in bold. Below the chart is a list of days classroom observation was made and the days that were reviewed for findings. Given the polysemous nature of gesture, the uses and functions of the examples selected contain overlapping characteristics that could be categorized and used to answer either of the research questions. In addressing this situation, categorization of example findings have been organized for their main or central role in the meaning making experience as previously expressed in Chapter 4. As shown in Table 5.1 below, categories and examples selected for the findings of this chapter are indicative of a variety of gestures viewed in multiple days and times in the classroom (see Appendix A). The categories selected from the data to answer research question one, are the following: 1. Establishing joint-attention, 2. Classroom management, 3. Content Coordination, 4. Interpersonal and

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Intrapersonal communication in relation to content development, and 5. Transformation

of task or activity. The categories selected to answer research question two, are the

following: 1. Establishing joint-attention, 2. Interpersonal and intrapersonal

communication in relation to content and language development, 3. Transformation of

task or activity, 4. Genesis and diffusion of content. Table 5.1 lists the gesture functions,

including their setting, for the research questions.

Table 5.1

Categories and Examples of Findings

Data Sections	Gesture Functions	Topic Sections	Example(s)	Setting
I. Research Question 1: How does the use of gesture operate as a form of meaning-making for both teacher and students in a second-grade sheltered English classroom?	5.1. Establishing joint-attention	5.1.1. Random Sample (IRF)	2	Floor time - math
		5.1.2. Fingers as numerical digits	3	Floor time – transition
		5.1.3. Singing & Chants	4, 5, 6, 7	Floor time – Language arts
		5.1.4. Classroom Management	8, 9, 10, 11, 12, 13	Classroom
	5.2. Content Coordination	5.2.1. Fingers as numerical digits	14	Floor time – transition
		5.2.2. Hands and fingers math problem	15	Daily Problem – Classroom White board
	5.3. Interpersonal and Intrapersonal communication in relation to content development	5.3.1. Hands and fingers math problem	16, 17	Daily Problem – Classroom White board
		5.3.2. Bedtime pantomime	18, 19	Floor time – math
	5.4. Transformation of task and activity	5.4.1. Realization of embodied answers	20, 21	Daily Problem – Classroom White board & Floor time - transition

II. Research Question 2: How does the use of gesture mediate learning of the second language?	5.5. Establishing Joint-attention	5.5.1. Partner reading	22	Classroom Stations – Language arts
		5.5.2. Small group reading	23	Small group reading – Language arts
		5.5.3. Phonemic awareness activity	24, 25, 26, 27	Small group spelling – Language arts
		5.5.4. Story reading time	28	Floor time reading – Language arts
	5.6. Interpersonal and intrapersonal communication in relation to vocabulary and content development	5.6.1. Defining vocabulary	29, 30, 31	Small group & one-on-one assessment – teacher's desk
		5.6.2. Interpersonal communication and personal narratives	32, 33, 34, 35, 36, 37, 38, 39	Floor time – Language arts & Small group spelling – Language arts
	5.7. Genesis & Transformation of task and activity	5.7.1. Phonemic awareness activity and English superlatives in math	40, 41, 43, 44	Small group spelling – Language arts; Floor time – Language in math; Floor time writing – Language arts
	5.8. Diffusion of content	5.8.1. English superlatives in math	45, 46, 47, 48, 49, 50, 51	Floor time – Language in math

Overview of Interview

This section explicates the two post-classroom data collecting interviews. Two interviews were conducted approximately one month after the completion of the classroom video recording data. The two interviews were used as a secondary source of data and as a way to triangulate confirmation of the findings. Interview data in this chapter is not highlighted to the same extent as the video findings methods. Interview

dialogue has been placed throughout the chapter according to its appropriate correlation to the themes and topics of the video data.

The two interviews lasted approximately two hours each and included a general questioning and video viewing format. The formal interview questions contained five sections: Background teaching history, general pedagogic and communication practices, gesture and nonverbal communication knowledge, video clip viewing questions, and final reflection on gesture and teaching (see Appendix D).

The interviews were transcribed and analyzed for thematic meanings. One theme that reoccurred throughout the interview and video viewing was using gesture as a concrete example to attach meaning to students' lives. Specific to ELL needs, Mrs. Dee believes that her students learn in a different way than mainstream English speaking students. Building on this idea, she explained that allowing for talking and discussion in school activities enhances language development. Unlike many mainstream classrooms where talking in line and during transitions between activities are discouraged and marks a classroom as lacking management, Mrs. Dee purposefully allowed talking. She explained her strategy as a means to meeting students' immediate language needs. She tried to balance a fine line between getting through the curriculum and allowing language opportunities for her students.

Another strategy she stressed in meeting ELL needs was watching them. If the activity or communication became problematic, she realized that she would need to do something different. Her philosophy on teaching is based not only on allowing the children's voice to show up in the classroom but to allow them to demonstrate where

language challenges were. She described many "teachable moments" as times that she had to deviate from the lesson plan and curriculum to meet the needs of her students.

Specific to gesture, Mrs. Dee found image and gestures to be an important part of communication and making meaning. She explained that when children didn't have enough vocabulary to describe or explain themselves, their movements helped her understand their meaning. To facilitate communication, Mrs. Dee believes that gestures are both "purposeful" and "unconscious" depending on the needs of the student and context.

Mrs. Dee viewed gesture overall as another important modality for communicating with the students. Her view of gesture extended beyond just social communication but included its importance in understanding content. She explained that children needed concrete examples and that even pictures were abstract in comparison to actually physically showing them something through gesture. Indeed, Mrs. Dee had strong opinions about gesture and its use for making-meaning, sharing experiences where showing or telling another way, beyond the verbal, was a better way to understand the students. Her comments demonstrated that her view of gesture was not just about her production of them but also about what gesture the students produced.

Random Sample Scene I

A random sampling of the data was analyzed for the purpose of demonstrating gesture's prominent role in an ESL classroom experience. Numbers representing each day of recording, hours of the day, and minutes of the hour were placed in containers and selected by a person not involved with this study. The selection resulted in Day 3 at

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12:43, a clip lasting for 4 minutes and 42 seconds during math time. All three cameras were reviewed to obtain multiple angles of the gestures being produced by the teacher and students.

Gesture throughout the random sample was found to play a vital role in the following: 1. Selection of participants, 2. Selection of content, 3. Directing of attention, 4. Providing answer cues, 5. Correcting or providing feedback, and 6. Clarifying turn-taking procedures, 7. Expression of thought and meaning beyond the basic definition of the vocabulary objectives. Gesture was implemented at a considerable rate in comparison to speech. However, moving beyond the numbers, the core content or central idea of the material being covered was almost always carried by some type of gesture. Consequently, the IRF activity's simplified structured and linear mode of communication was not necessarily the only strategy or modality as a language learning, content carrier, or meaning-making function for the students. This will be discussed in future sections in this chapter.

The random sample provides only a minimal idea of the role and use of gesture in any one given task during the day. Gestures are polysemous, such as being deictic/indexical and a beat at the same time, making an exact count illusive. The descriptive statistical analysis assigned only one number and gesture for each spontaneous hand movement in relation to the turn-taking pattern of the IRF. Regardless of this limited coding pattern, the rate, content, and meaning demonstrated in the gestures provides the viewer with evidence of the magnitude and value of its use.

The activity in this clip was whole group math instruction with the class sitting in "floor time" and the teacher in her chair in the corner below Camera 2 (see Figure 1). The

lesson in this clip was on telling time and the objective was to have students understand

how the hour and minute hand works and the terms: o'clock, half past, quarter past, and

quarter to the hour. A wooden analog clock for teaching purposes was being used as the

object of focus. This was not a functioning clock. It contained a typical clock number

pattern with minute and hour hands but also had small numbers that progressed by five

outside of the outer rim of the numbers one through twelve. These small numbers on the

outside of the clock area correlated to the hours of the clock, such as five was near the

one, ten was near the two, fifteen was near the three and so forth. The small five is

referred to in a future example. The teacher turned the hour and minute hand to

demonstrate and assess students on their ability to use colloquial time-telling language.

To teach the time-telling vocabulary, the teacher used a recitation procedure

commonly referred to as Initiate-Respond-Evaluate (IRE) or Initiate-Respond-Feedback

(IRF). An IRF usually requires three turns. It begins with a teacher requesting an answer

to a question or comment. A student is then selected to provide a response and then the

teacher comments on whether the answer is correct, partially correct, or needs to be

dismissed. This pattern is usually repeated several times as a means of exchanging and

assessing student knowledge of a topic. A small transcription portion of the random

sample scene was selected to demonstrate the turn-taking sequence as the main technique

during the IRF time-telling task, a sample of which is provided below.

Selection from Random Sample
(Day 3) (2A.3, 17:34) (1A.12, 8:35)
032   T: [I think you had a turn, buddy. And **I'm** going to stop.] And S11 what time is
         it?
          Stops turning the minute hand around the clock
033   S11: One o'clock

034   T: [**One**] [**o'clock**]
Points and touches 1; Points and touches 12
    And, uh
Preparation gesture – finger starting to extend but being held up
    [**S12**,] [did she say the **hour**] [**first** or the minute?]
Points to S12; Points and touches the hour hand; Quickly moves hand and points and touches the minute hand

Figure 1. Line 34: Mrs. Dee "one-o'clock"

035   S12: the hour
036   T: And the time is moving, moving, S1 you're next, okay.
Moves the minutes hand around a few times
    And what time is it, [now we're going to say the **hour** first] [and **then** the minutes.]
Points and touches hour hand; Points and touches minute hand
037   S1: Four o'clock
038   T: Four o'clock, [**S6** did she say the hour first or the minute?]
Points to S6 and quickly pulls finger back into hand
039   S6: hour
040   T: okay, S16, you're next, are you ready?
041   S16: Six o'clock
S8: Raises both hands with five fingers on the right hand and a thumb on the left hand pointing out to represent 6
042   T: [It is **six**] [**o'clock**]
Point and touches hour hand on 6; Points and touches to minute hand
    [and **S19**,] did he say the hours first or the minutes?
Prestroke hold while exaggerating the pronunciation extension of "and" then points to S19

Mrs. Dee's pattern of assessing students' knowledge of time came through a series of questions based on the movement the clocks hands and the directing of attention towards a number on the clock through pointing. The pointing to the number provided the necessary information to direct the students towards the content of the question and provided them the appropriate response.

Concerning the entire lesson, Mrs. Dee explained in correspondence outside of class time and during the post video-recording interview, that she did not believe that formal lessons on time were appropriate for this age group's developmental level. She shared the example that students at this age do not understand a larger concept of time concerning the length of an activity, such as how long it takes to go shopping or driving to places. Despite these reservations, Mrs. Dee expressed that she was obligated to cover time according to state standards.

Transcription and a descriptive statistical analysis of the data resulted in the following totals: In four minutes and forty-two seconds, the teacher and students produced 802 total words. The teacher spoke 701 words and the students spoke 101. There were approximately 121 distinguishable hand motions as gestures that accompanied the speech. The teacher performed a total of 111 hand gestures and the students performed 10. Hand-raising was not counted as a gesture in that it was not part of the spontaneous performance for gaining meaning but part of a more codified systematic procedure containing one concrete meaning in this initiate, respond, feedback (IRF) activity. In the 282 seconds of this clip, the gestural performance mean was 1 every 2.3 seconds (Table 5.2). The ratio of gesture to words was 1 to 6.6 (1:6.6). Deictic or indexing gesture in

this sample was the most dominant, being produced 49 times out of 121 or about 40% of

all gestures.

Table 5.2

Random Scene Selection of Gestures in Four Minutes and Forty-Two Seconds (282 seconds)

	Words	Hand Gestures	Gesture Rate
Teacher	701	111	1 every 2.5 seconds
Students	101	10 (not counting hand-raising)	1 every 28.2 seconds
Totals	802	121	1 every 2.3 seconds

The sampled clip exemplifies the ubiquitous use of gesture in communication as a part of

meaning-making. This is of particular interest when considered in the context of the

recitation activity. An IRF recitation strategy typically provides a limited and easily

identifiable pattern of communication for all participants. Students know when to respond

and are often given cues on how to answer. Teachers are in control of the direction and

speed the line of questions take. Although responses were typically one or two words,

exemplifying simplified communication patterns; the findings suggest that gesture played

a significant role in moving the activity forward.

Research Question #1: How does the use of gesture operate as a form of meaningmaking for both teacher and students in a second grade sheltered English classroom?

In this section, I will use examples and transcriptions from the video data to articulate the scope, variety, and use of gesture in language to answer the first research question: (1) How does the use of gesture operate as a form of meaning-making, for both teacher and students, in a second grade sheltered-English classroom? Findings from the random sample scene and interviews are also included where appropriate. This section is divided into the following subsections according to the role or function the gesture played in meaning-making between the teacher and her students. To answer question one, scene clip examples were purposefully selected to demonstrate how gesture operated as a form of meaning-making: 1. Establishing joint-attention, 2. Classroom management, 3. Interpersonal and Intrapersonal communication in relation to content development, 4. Transformation of task and activity (see Table 5.1).

Establishing Joint-attention

The focus of joint-attention on a third object as *shared intentionality* is a form of cooperation unique to Homo sapiens. Indexical or deictic gestures are usually performed between participants to direct them in sharing joint-attention frames or foci. Evidence for this was found in all data examples but was particularly high in the random sample scene. The random sample scene also provided a variety of gestures, and because the contexts have already been specified, it is included here as well.

Random Sample Scene II

The analogue clock in this scene provided a mutual object of focus for the teacher and students. Terminology for learning time is embedded within the vocabulary associated with the tool with the use of the term, "hands". The hour and minute indexing features are both addressed as hands and functioned as indexical objects used by the teacher to direct students' attention towards the desired answer. An answer was found in the placement of the clock's hands. However, the teacher also used her hands as a tool for making-meaning and consistently used her index finger as a means to elicit an answer.

In this initiate-respond-feedback (IRF) activity, deictic gesture played a central role in all three phases. The teacher assumed the lead role and initiated questions both verbally and through gesture. Verbally, a linear pattern of selecting the student, asking a question, and responding occurs throughout the scene. Unlike speech, the gestures in this data revealed functions that did not work in the same linear manner as speech in the IRF pattern. The teacher performed deictic gestures during the initiation phase not only to select students and direct their attention to hers, but ultimately, to guide them towards the answer. The data contain 17 deictic-haptic examples, in which the teacher pointed at the answer during the initiation phase. This showed a dyadic function of meaning for these gestures not present in speech. The indexing directed the students' attention toward the clock in a presentation fashion that complemented the speech during the initiate phase. Through this gesture, an invitation for cooperation in joint-attention and mutual knowledge is presented to the students. However, Mrs. Dee also provided the students with an answer that would parallel speech only found in the third, *feedback,* phase of the IRF. In this case, deictic pointing transcended the IRF pattern and provided the students

with not only a joint-attention guide to initiate the student towards the selected content,

but also demonstrated a guide towards development of the response. In the third part of

the IRF phase, the teacher's finger pointing provided students with a guide to the answer.

Throughout the practice, when an inappropriate response was given, the teacher used her

index finger as a meditational tool to direct the students towards the correct answer. One

example, lines 58-61, shows how the teacher used deictics as a way to redirect the student

towards the correct answer and a shared understanding of her explanation:

Random Sample Scene (Day 3, Minute 8:58)
Example 2:
058   T: That's an [**excellent**] description.
      Open palm with beat
        Because [thirty minutes **went by**]
      Points to 12 and runs index finger down to the 6
        And we can count the minutes,
      Points to 12 and runs index finger to 1 – time moving message
        [A **quick way** to count the minutes is by **fives**].
      Open palm presentation and turns to an index finger pointing back to the clock
        And on [**this** clock],
      Pointing of right hand towards the clock and then grasping and switching hands.
059   S?: Five, ten, fifteen
060   T: *Shakes her head side to side, "no"*
        On this clock the minutes [are written by five in little numbers around the outside.]
      Index finger pointing to small circles near the big numbers; Points to 5, 10, and 15
        [**Here's** the five and I'm going to hold it], S13, I want you to look.
      Index finger pointing to a small 5, just outside of the number one as previously mentioned earlier in the chapter. This finger is also assisting in holding the clock; She stands up and presents the clock to individual students
        [The little minutes go around counting by fives]. Five, ten, fifteen, twenty, twenty-five, thirty. Is my hand on the thirty? Nope, stop.
      Holds right finger on 30 then moves the plastic hand and her fingers off of the little number 30

As lines 58-60 show, the students began to move into a recitation practice of counting by five; however, Mrs. Dee quickly redirects them and points out small numbers adjacent to the usual one, two, three, and so forth, numbers. These numbers by five are typically not available on most analogue clocks and Mrs. Dee redirected and established a joint-attention sharing space with the students to make meaning and use of this particular content. Throughout the random sample scene students were able to see the expected response through Mrs. Dee's index finger.

Fingers as Numerical Digits I

During transitions between subjects and formal activities, Mrs. Dee allowed for casual conversation. As Mrs. Dee organized material for the next subject, students gathered together for floor time. They talked about all the missing students and having such a small class. Multiple students began pointing and counting how many were in class. Mrs. Dee looked up and joined the conversation when she realized that students were producing wrong answers for their total. The lesson was delayed, as this became a teachable moment. In interview 1, Mrs. Dee expressed the importance of deviating from the lesson to meet the needs of her students, stating, "teachable moments occur and you can either take advantage of them or you can't" (1:43:40). The example below demonstrates this spontaneous "teachable moment" and the role gesture played in making-meaning of the problem.

Example 3
1M.1 (Day 2) (29:27)
Beginning Floor Group Discussion/Lesson
01   S17: I think there are 16 people. I counted backwards; I skipped 18 and 17 and
           ended with 16 [*II*].
           Places index finger in a perpendicular position over closed lips.

02   T: And [if we had only **two** people absent], [**you** would be right but we actually seem to have four we have],
Two fingers extended down at lap level (providing a horizontal plane) then deictic pointing on second stroke towards S17. Then lifts four fingers up above lap.
        [**S1**, **S13**, **S3**, and **S14**]
Begins to single out each finger in conjunction with the name of the child. The left hand fingers are all spread apart but she groups them together and counts them off, pointing with her right hand as she states the names of the students who are absent.
03   T & Ss: [And **S7**]!
She moves her hand back to the original spread out 5 fingers, palm facing her, when she realizes that they all forgot S7.
04   T: [**So** start at 18 and let S17 do this.]
Pointing at S17 with left hand index finger
(30:06)
        [Start at 18 and use **your strategy**] to get to how many we have here today
Left hand retains the five spread out fingers and the right hand makes an arching motion and deictically points to the left hand
05   S17*: Puts hand out with 5 fingers extended to count down from 18*
06   T: [**Shhhh**], [***lll***]
Touches S8 on the shoulder with right hand; Puts both hands next to her cheeks and opens mouth wide in shocked look; Places index finger over lips. She manages the shout-outs with non-verbal gesture with a "shocked look" and finger over the mouth.

The use of fingers as digits in example 3, provided a variety of gesture functions.

Concerning a joint-attention focus situation, lines 2-5 provide evidence of a shared

attention frame by representing the counting of students on fingers. The focal point Mrs.

Dee desired was on the numerical digits of the hand, which provided a gesture for S17 to

imitate. In addition, she added a prolepsis component stating that it was his strategy. Mrs.

Dee refers to this gesture as "your strategy" (line 4) although S17 has not used his fingers

during this dialogue. It is possible that she has seen him use this strategy in the past

(Interview 1&2) but she initiates this particular gesture in this scene. As a form of shared-

intentionality, S17 begins to use his hands in a similar but not the same pattern as Mrs.

Dee. In addition, Mrs. Dee performed a gesture for classroom purposes that facilitated a

joint-attention experience between herself and S17. In line 6, Mrs. Dee is able to silence the class without talking over S17's turn. This function of gesture was performed on a daily basis as means to silence the class while allowing a space for a student to respond. In this case, the students quickly responded and the class was quiet while S17 worked on the problem. The minimal waving of the hand allowed Mrs. Dee and S17 to remain on the task continuing the shared intentionality provided in the initial part of the dialogue.

In review, Example 3 contained evidence of gesture's use in establishing joint-attention, facilitating classroom, coordinating content, and assisting in inter/intra personal communication. Of particular interest was the joint attention Mrs. Dee provided when she turned the counting of missing people into an embodied, finger coordinated movement. S17 imitated her example, but his use was not the same. This joint-attention still provided both participants a shared concrete representation of the problem they were trying to address.

Singing and Chanting

A singing and chant activity was performed at least once a week. The purposes of these activities were to teach the student grammar, vocabulary by memory, and contained prosodic functions such as intonation, stress, and rhythm. The activity was performed in choral chant and song genres with Mrs. Dee often singing and playing the guitar to the songs. Two poster boards, adjacent to the teacher's chair, were used in this activity at the floor reading area. The first was a top 20 "commonly used words" for reading and writing embedded in separate verses in a chant. The second was another chant and rhyme that focused on punctuation conventions. One weekly student job was to be the leader of the chant/singing time. While the class sat in their reading area, the leader stood by the poster

boards and pointed to the words to be chanted or sung (see Figure 2). The teacher sat at

her chair and played the guitar depending on whether it was a song or chant (see Figure

3). Both the teacher and students followed the lead of the student leader. The student,

S16, led by pointing at the words on the charts. The gesture affected multiple aspects of

the activity since it directed the attention of the students towards the vocabulary, the

rhythm, and coherence of the content and mode of practice.

Example 4
2M.1 4-20 Day 6 (1:04:52)
Song
08   T & Ss:
        [**I'm a little period small and round.**
        After a statement I'll be found.
        If there's information, I am there.
        At the very end, that's where.]

09   *S16: Student extends arm up and points to words with index finger. He is in front*
        of the wall and his finger points right to the word which places his hand between
        the students and the word they are supposed to read and recite. Points to each
        word for the students to follow. The teacher and class follow the student's
        pointing rhythm, which does not keep pace with the traditional "I'm a little
        teapot" song. His pointing demonstrates stroke, beat, and deictic-haptic pointing
        on each word.

Figure 2.
Mrs. Dee and S16: Top 20 words chant

Figure 3.
S16: "I'm a little period"

10 T: Hold on, uhm,uhmm, (whispers - no, no), so, but the good news is, is that you recognized. So when you are pointing if your hand is on top, people can't see the words. So you can come from the top:
--*Teacher sings:*--

11 T: [**I'm a little period small and round.**
After a statement I'll be found.]

12 *S16: Hand, arm, and body are still in the way of seeing many of the words from the students' perspective. Lacks timing coordination; He misses pointing to the words when they are being sung.*

13 T: So every time we say a word, you point to the next one. All right, so maybe I'll do it from over here. You have to stand back, that's the tricky part, I better actually come over here where there's more room where people can see. Ready? I'll go a little bit more slowly, okay?

In lines 8-13, the chant does not follow the "I'm a little teapot" beat pattern. The student struggled to point to the correct word in a timely fashion that would lead the choral chant. This invoked the teacher's correction (lines 10 & 13).

In the next section (lines 14-26 & 55-56), gesture takes the lead in the pace and prosody of the content. The teacher and class follow the student's index finger. Mrs. Dee continues to accompany the song with her guitar but also tries to prompt the leader, S16, to move his hand. She and the students try to follow his gesture regardless of when his timing is on or off.

Example 5

14 T & Ss:
[**I'm a little period smaaaall**],

15 *S16: Keeps index finger on the word "small"*

16 T: (prompts S16) Keep going, (goes back to singing) and round.

17 T & Ss: [**After a statement I'll be**] fou--nd///

18 *S16: Points to each word but leaves his finger on "be" and does not move it to "found"*
T: Mrs. Dee continues to hold the note out on her guitar on "found",

19 T prompt: uh, uh where's "found?" / it's at the end of the sentence.

20 *S16: Moves index finger to "found"*

21 T & Ss:
[**If there's information, I am there.**

At the very end, that's where.
I'm a little period,] one round dot,

22   *S16: Pointing, deictic-haptic, to each word behind the beat of the song*
23   T: (prompts S16) uh, dot is at the end, dot is at the end. [And you have to point at the top honey, at the **top]**, [look at my hand, like **this,** because you are covering the words,]
      T: Uses right arm in an arching form with elbow at highest point and wrist bending the hand down with index finger pointing down to the ground; beats down with index finger pointing towards the floor (guitar music has stopped)
24   *S13, S11, S3, S1: All mirror Mrs. Dee's arching arm gesture for S16 with their index fingers beating down towards the ground*
25   T: There you go *(Tries to start up again but loses the note)*, oh, woops, we have to start again, sorry.
26   Ss: aahhh
(Skip to 55-56)
55   T& Ss: (singing) [**Look and find me, Be aaaware**]
56   *S16: Pointing too slowly and falling behind beat*

During this activity, the teacher played the guitar but would hold out the note as long as the leader kept pointing at the word. Depending on the speed, vowel sounds were exaggerated according to the placement and length of the gesture on the word. This caused an exaggeration of the vowel sounds in some of the words making the phonetic sound of the word different from its conventional use (lines, 11, 14, 17). In this case, the leader decided the beat speed, but because of his erratic movements the pronunciation flow of the words were unconventional. The teacher tried to correct the pattern with verbal prompts but did not take the lead in singing or playing the guitar past the gesture demarcation. By line 21, a bit of confusion occurs with the pointing being off the beat of the chant. At this point, the teacher stops and proposes a better approach to pointing at the words by placing the hand above them with the finger coming pointing down on them. The focus on the pointing gesture and modeling has the entire class captivated by the situation and at least four students also demonstrate how to point down on the words (line 24). Eventually, Mrs. Dee takes over the pointing job and even holds his hand to show

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him how to do it. She does not remove S16 from his job but uses the occasion to model

and train him on how to point and direct the class in the chants:

Example 6
32   T: I'm going to point so you can see. This is a tricky one and you really need to follow along. So you are going to stand here for a second, and you are going to watch, now you have to, [so, so, **this** is a word, **that's** a word, that's a word,] so you have to point to each word as we say it. Are you guys ready?
33   *T: Points to words with exaggerated up and down movement between the two words*

In the clips above, the leader S16 and his gestures become the focus of discussion.

Prompts and comments in lines, 10, 13, 16, 19, 23, 25, 29, 32, 33, 47, 50 by the teacher

are directly related to the leader and his deictic gestures. The leader continually points

with his index finger extended upward with his hand below which covered the words the

students were supposed to sing. Lines 32-33 provide evidence of the shared focus and

importance of joint-attention in the pointing gesture function. The importance of

pointing at the right time was emphasized when Mrs. Dee provided explicit training on

how to do it. Hence, the content of the chants or songs were consistently interrupted to

provide demonstration and training of the pointing gesture.

Not only does the practice revolve around the deictic gesture of the leader student,

Mrs. Dee continually supports this process with positive statements and examples

regardless of how well the leader performs the task. Mrs. Dee continually plays the notes

and sings the words according to the beat of the deictic gesture. The students watched

S16 pointing to the board but were strongly influenced by the teacher's singing and

holding of notes by the guitar. S16's pattern did not necessarily hold all of the students'

attention but was meticulously followed by Mrs. Dee. Hence, S16's deictic gestures

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influenced the students' perception directly and indirectly through Mrs. Dee's perception

of the gesture. This pattern was repeated two or three times on a weekly basis. During

day 9 singing practice Mrs. Dee corrected his pointing pattern again. After trying to get

him to move out of the students' viewpoint, she stopped the song and got up, saying:

Example 7
(Day 9: 1M.6, 4:32:15)
01   T: My words may be confusing, you can do this: (chants) [**Here** are twenty words
           you'll need]
        *Gets up and holds guitar in left hand, points to words with right hand and points
        from below the word with index finger touching the bottom of each word*

By day 9, S16 and the class performed at a more efficient pace with less prompts

from the teacher. Responses became more synchronized with the gesture. Speed and

rhythm of the chants and songs were completed in a shorter and less interrupted manner.

As a result of S16 pointing and touching the correct word on the correct beat, the leader,

Mrs. Dee, and the students shared in a joint-attention activity led by gesture. This

provided a meaningful experience in the activity as words were no longer parsed into

hyper-extended pronunciations and a flow in the prosody of the words emerged.

Classroom Management

The excerpt below is one example of a classroom management routine Mrs. Dee used

on a daily basis. In this management approach, the students do not respond verbally but

physically through gestures to demonstrate compliance and listening skills. This

management exercise was implemented when the noise level was high and the teacher

wanted to make an announcement or give an explicit instruction to the entire class.

Example 8
1M.1 Day 3 (42:40)
01   T: [**Okay**], [if you're listening touch your **nose**///]
        Puts hand up with palm out signifying stop; then touches her nose with both index
        fingers
        Ss: Some students touch their nose
02   T: [If you're listening **touch** your chin///]
        T: Places both index fingers on chin, then turns head to make eye contact with
        student still talking
        Ss: Most students are now quiet and touching their chin. They look at Mrs. Dee
        and at each other.
03   T: [If you're listening, **touch** your shoulders///]
        T: Places hands on both shoulders
        Ss: All students except S4 are now mimicking Mrs. Dee and the room is silent
04   T: S4, shoulders (in a whisper voice)
05   S4: *Looks up at teacher and other students, puts paper down and touches both his*
        shoulders

In this management routine, the class, at the beginning, was not completely

synchronized in performing the gestures. Example 3 data displayed only a few students

following the teacher's performance of touching their nose. More students reacted after

watching Mrs. Dee perform the actual gesture of touching her nose. Another set of

students joined the first set when they observed them touching their chin. Students not in

sync with the teacher's instructions looked at other students to perform the "correct"

gesture. By the time the teacher requested the students to touch their shoulders only one

student, S4, in the class remained disengaged from the activity. When Mrs. Dee

whispered to him by name and said "shoulders", the student quickly understood the

pragmatic meaning and touched his shoulders. This joint-attention activity provided Mrs.

Dee and her students a way to understand when Mrs. Dee wanted them to stop what they

were doing so they could receive new or additional instructions. Through mimicking Mrs.

Dee, the students demonstrated attentiveness and produced a shared foundation from

which Mrs. Dee could continue to instruct the class.

Classroom management gestures were discussed in Interview 2. Mrs. Dee explained

that, "teachers give directions [orally] all day long. How annoying!" (1:02:50). She went

on to explain that it's a way to do classroom management requests differently as a result

of having to do it "Eight million times a day" (1:03:44). Reinforcing her belief that

gesture is a useful modality and that children learn through seeing information in a more

concrete manner, Mrs. Dee employed this practice on a daily basis. She shared, "there's

always someone watching you and they see you and then another person sees them… it

spreads out the responsibility (1:03:53). Gesture's used for classroom management

processes allowed joint-intentionality between the teacher and students who were not the

primary participant in the dialogue. Through gesture, Mrs. Dee was able to allow

participants to continue their dialogue with little or no interruption.

Example 9
(Day 3, Minute 8:58)
While a student is answering a question during a floor time group instruction
06   T: [Shhhh], [***III***]
        Touches S8 on the shoulder with right hand; Puts both hands next to her cheeks
        and opens mouth and eyes wide in a shocked look; Places index finger
        perpendicular over pressed lips.
Example 10
(Day 2, 1M.1) (29:27)
Beginning Floor Group Discussion/Lesson
01   S17: I think there are 16 people. I counted backwards; I skipped 18 and 17 and
        ended [with **16**.]
        T: Places index finger over mouth, students become quiet

Through spontaneous hand motions of up and down, index finger to the lips, or

waving away, Mrs. Dee was able to send a message to students interfering with the one

student or group she was working with, to quiet down, move, or go away. This allowed

the student or students she was working with to continue with reading or responses

without being interrupted.

Classroom management gestures were used throughout the day regardless of whether

it was whole class, small group, individual work, testing days or any other instruction or

activity in class. The use of gesture as a formal practice for classroom management

purposes took on multiple forms.

Example 11 (Random Selection Scene)
062   T: Nope, stop. Do you see the thirty?
       Continues to present the clock to individuals
          And it's right down by the six, S18? Can you see it S19? So, [**hold** on]
       Uses index finger to point to a student that is talking simultaneously
          So, S18, [why do we say,//]

Example 12
Day 7 2M.1 4-21
05   T: We're going to read, [put your hand **down**.]
       Point hand back out towards the students, extends fingers with palm facing down
       at the height of the student's raised hand and waives it down towards the ground

Example 13
1M.4 Day 7 (19:56)
01   So my story is that I gave Winston a bath. [You'll have to come back **here.**]
       A student moves from his original spot on the floor; Mrs. Dee looks at the student
       and points down at the floor. Student moves back while she continues to talk.

Mrs. Dee's use of gesture to have students wait or direct their attention towards proper

actions, occurred multiple times a day and demonstrated a conscious effort on her part to

keep joint-attention with the flow of a student's conversation as well as possible, despite

having to attend to the statements or activities of other students. Gesture's that redirected

or promoted silence provided a joint-attention with the student or students, whose talking

turn was not theirs. With a hand motion, students were able to make meaning of Mrs.

Dee's requests. They responded with being quiet and waiting their turn, allowing the

current participating student to continue talking without interruption.

Content Coordination Function

Fingers as Numerical Digits II

The use of fingers and hands in this study was not only found to establish joint-

attention sharing information but also worked as an embodied form of content

coordination. When the teacher or students experienced a list of similar content or

categorization needs, the reliance and use of fingers as a carrier and organizer of the

content developed. In Example 3, fingers used as numerical digits was viewed for its

joint-attention sharing function but it also acted as a tool to coordinate the number and

the names of the missing students. In the following example, an understanding of content

coordination is displayed through the use of fingers.

Example 14
1M.1 (Day 2) (29:27)
Beginning Floor Group Discussion/Lesson
01   S17: I think there are 16 people. I counted backwards; I skipped 18 and 17 and
         ended [with **16**.]
         Places index finger over mouth, students become quiet
02   T: And [if we had only **two** people absent], [**you** would be right but we actually
         seem to have four we have],
         Two fingers extended down at lap level (providing a horizontal plane) then deictic
         pointing on second stroke towards S17. Then lifts four fingers up above lap.
           [**S1**, **S13**, **S3**, and **S14**]
         Begins to single out each finger in conjunction with the name of the child. The left
         hand fingers are all spread apart but she groups them together and counts them
         off with her right hand as she states the names of the students who are absent.
03   T & Ss: [And **S7**]!

She goes back to the original spread out 5 fingers, palm facing her, when she realizes that they all forgot S7.

04   T: [**So** start at 18 and let S17 do this.
Pointing at S17 with left hand index finger

(30:06)

       Start at 18 and use **your strategy**] to get to how many we have here today
The left hand retains the five spread out fingers and the right hand makes an arching motion and points to the left hand

A coordination of name, number, and finger become visible in line 2. Mrs. Dee provides S17 an embodied process for coordinating the names and numbers and counting backwards. However, S17 used the fingers to count up and comes up with fourteen as the answer. Upon hearing and seeing his confusion, Mrs. Dee reminds him how he was going to use his gesture. She mimetically presents a form for him to follow and gets one finger down before seeing S17 starting to count using his fingers. At this point, Mrs. Dee allows him to continue although he is using his fingers to count up again. After a pause, she interjects and explains how she would do it by displaying all five fingers again and counting down to thirteen (lines 10-11). Although finger gestures are being used as a modality for carrying the procedure of numerically counting backwards, the context of the situation demonstrates that it carries the representation of the students as content. Thus a representation of names and numbers are coordinated into one embodied gesture. The act of placing content and numbers together provided a fluid and holistic mode for keeping track of various pieces of information.

Hands and Fingers Math Setting

Another example of content coordination was found in a task between Mrs. Dee and S3 during math time. On Day 15 Mrs. Dee announced that "Testing" was coming up next week. She introduced "starter problems" to help the students understand the test's

language and process. The next morning, students had three problems to solve. These questions focused on language and math. Students were to try independently and then go over them as a class. Mrs. Dee circled the room to individually assist students who were struggling to come up with an answer. During these challenges, Mrs. Dee and the students often turned to gesture as a problem solving strategy. The following example demonstrates the rise and use of gesture to solve the problem. In this problem, a chart on the white board at the front of the class, contained two columns labeled "hands" and "fingers". It is possible that a question such as this elicits an invitation for a student to use a hands and fingers strategy to solve the problem. The chart is based on the factoring of 5 fingers and multiple hands. However, one written problem stating hands and fingers does not necessarily change a multiple-choice test's pattern of filling in the blank or containing a form of questions that are outside of or unusual to the student's daily meaning-making experience. The students answered these questions at their desk on paper (see Figure 4 & 5). A shift from a paper and pencil at the desk activity to an embodied experience for solving the problem occurs below.

Example 15
1M.1 Day 15 (0:15:40) (0:16:20)
15:40
01 T: What is the first set of numbers that you see? // Maybe we should start first, what is the name of the table?
  (refers to table at the front of the classroom on the white board)
02 S3: *inaudible – hands are pulling on her collar and front of shirt*
03 T: It's actually "Hands", "Hands and Fingers" // [So **look** at your hand]
  Points down and taps on S3's paper two times with her right hand
04 S3: *Puts left hand palm up facing self, fingers extended, with right hand holding pencil*
05 T: [Okay, how many hands is **this**?]
  Grabs S3's wrist and shakes her hand, back and forth in front of S3's face
06 S: One

Looks at palm of left hand with fingers extended

07   T: One hand. How many fingers?

08   S: [Five]
Hand is still held up, fingers no longer extended but slightly curved towards her palm

09   T: [**Now** look up] at the chart. Do you see one hand, five fingers? ////// Do you see it   Elsa?
T: Points with right hand index finger towards table on the white board
S: Continues to hold up her left hand with palm facing self and fingers slightly curved towards palm

10   S3: [//// I **think** I, // I know the answer. Number three.]
Left hand is still up with palm facing self; all five fingers extend out

Figure 4. Line 10: Mrs. Dee and S3 "I think"

11   T: Why do you say that?

12   S3: *Shrugs shoulders up and down. Hand is still up in the air. Fingers go back to a curved position towards the palm of her hand*

13   T: You're right but you have to be able to explain to me why you said that.

14   S3: [Because the **number**],
Looks at hand, palm facing up

15   [the reason is that there's **one hand**], [**one** and there's five fingers], it can get to 15.
Put hand back up closer to face level with palm towards her; Shakes and points to the palm of the left hand with the index finger and pencil in her right hand; then moves pencil towards the ends of the fingers, running the pencil from the bottom of the fingers to the tips. Quickly grasps the pencil when she finishes her statement.

16   T: [How does it get to **that**, S15?]
Turns both hands palm up in front of S15

17   S3: mmmm, I don't know.

18   T: Well, let's come up and look at it because, you're right but you've got to be able to explain it to me. (17:00)

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Mrs. Dee and student get up and walk from S3's desk to the table on the whiteboard.
(17:20)

19   T: One hand, show me one hand. [**How** many fingers are on that hand?]
      T: Mrs. Dee deictic point to the chart and haptic touch to each part. Touches the number 1, the word hand, fingers, and the number 5 on the chart.
      S3: Brings left hand, palm up with fingers extended, out in front of her just below shoulder level

20   S3: Five

21   T: [Let's look at, so **one hand**] [**five** fingers.]
      Points to word "hand" on chart, then moves to next column and then points & touches number 5. She moves her finger in a downward motion from the word at the top to the number she states.

22   T: [**The next** number under hands is what?]
      Points with right hand index finger back to the hands column one level below the "1"

23   S3: Two

24   T: So show me [two ha**nds**].

25   *S3: Lifts both hands up, palm facing towards the board in the same direction she is looking, T is to her right*

Figure 5. Lines 25-26: Mrs. Dee & S3 near chart

26   [**And** how many fingers does the chart say there are?]
      T: Index finger continues to point to the number "2"; and then moves hand to the next column to the number "10"
      S3: Continues to hold up two hands with palms facing the chart at chest level away from self.

27   S3: Ten

28   T: Is that right? Okay

29   S3: [I **think** there's ten fingers.]
      Turns palm back towards self while answering the question and then faces them back towards the chart.

30   T: So that's right. Okay. So if you have two hands you have ten fingers, according to this chart. [What's the next **number**?]

Index finger points to the number "3"
31   S: [Three]
      Right hand still has fingers extending but is now perpendicular to the chart and her body and is pointing towards the three.
32   T: Three what?
33   S3: Hands
34   T: [**Want** to borrow my hand?]
      Places her left hand, palm up, adjacent to students' two hands, which are palm down. T's right hand index finger continues to point to the three.
35   S3: *Shakes head up and down "yes"*
36   T: Okay. [So three **hands**], [how many **fingers**?]
      Points and touches with right index finger "hands" in the left column; then moves to the right column and points/touches blank space under the "fingers" column
37   T: So three hands, [**how** many fingers?]

      Points with right index finger to the blank part of the table
38   S: Zero
      Brings in all extended 10 fingers and closes both hands. (The space for the answer was blank)

Of particular interest is the question asked in line 16, where S3 is asked how she came up with the answer. When S3 shrugs her shoulders and says she doesn't know, Mrs. Dee turns to a gesture modality to assist S3 in coordinating the table's data with the answer she developed. Lines 19-36 show coordination between the table content and the placement of information on S3's hands. When Mrs. Dee points to two hands, S3 presents two hands. When Mrs. Dee points to the next column, which was 3, Mrs. Dee offered her a third hand (line 34), S3 uses her hand as needed for the remainder of the activity. When Mrs. Dee points to the blank that needed to be answered, S3 responds with "zero" and her hands demonstrate a coordination with the answer with her fingers retracting into a fists and her hands dropping down from the chest level. This gesture function not only goes beyond a joint-attention experience but also provided S3 a tangible and concrete way to keep track of the multiple figures in the problem. She and Mrs. Dee end up doing some counting with fingers but the coordination of S3's hands

and fingers also demonstrate that the fingers were not just keeping track of numbers, they were keeping track of the content, "hands" and "fingers", that each box in the table requested.

Interpersonal and Intrapersonal Communication in Relation to Content Development

Interpersonal and intrapersonal relations is concerned with interaction, participation, and shared-context of speakers, both externally for others or internally as private or inner-speech for the purpose of understanding or making meaning of a process or activity. Interpersonal communication provides a movement of information from just a perception of a sign to an understanding of its message in relation to other contexts and people. Interpersonal communication includes the ability to work out a message or co-construct meaning of semantic and pragmatic functions in language. Intrapersonal communication also follows this pattern, although, as a voice for oneself. van Lier (2004) explains that there is an interdependence between language and conceptual development. In the following examples, school subject-content, is a part of conceptual development. Gesture is highlighted for its role in providing meaning both interpersonal and intrapersonal communication in relation to content development.

Hands and Fingers Math Problem

The math problem "Hands and Fingers" on Day 15, was on the white board as a starter problem for the day. Mrs. Dee saw that S3 was struggling and provided one-on-one assistance to help her accomplish the task. At the beginning of the dialogue, S3 came up with the correct answer but was unable to respond to Mrs. Dee's tag questions. When

Mrs. Dee realized that S3 didn't completely understand the problem, Mrs. Dee shifted to

an embodied process to help take on this problem.

Example 16
1M.1 Day 15 (0:15:40) (0:16:20)
03   T: It's actually "Hands", "Hands and Fingers" // [So **look** at your hand]
        T: Points to space over paper
04   S3: *Puts left hand palm up, fingers extended, over the paper on desk with right*
        hand holding pencil
05   T: Okay, [how many hands is **this**?]
        Grabs S's wrist and shakes the hand in front of student at face level
06   S3: One
        S3: Looks at palm of hand with fingers extended
07   T: [**One hand**.] How many fingers?
        Squeezes S3's hand twice around wrist and releases her hand
08   S3: [Five]
        Hand is still held up, fingers no longer extended but forming a closing/grasping
        form.
09   T: Now look up at the chart. Do you see one hand, five fingers? ////// Do you see it
        S3?
10   S3: [//// I know the answer. Number three.]
        Hand was left up with five fingers extended and palm facing self, from when Mrs.
        Dee held it up
11   T: Why do you say that?
12   S3: *Shrugs shoulders up and down. Hand is still up in the air.*
13   T: You're right but you have to be able to explain to me why you said that.
14   S3: [Because the **number**],
        Looks at hand, palm facing up
15   [the reason is that there's **one hand**], [**one** and there's five fingers], it can get
        to 15.
        Put hand back up closer to face level with palm towards her; Shakes and points to
        the palm of the left hand with the index finger and pencil of right hand when and
        then moves pencil towards the ends of the fingers, running the pencil from the
        bottom of the fingers to the tips. Quickly grasps the pencil when she finishes her
        statement.
16   T: How does it get to 15?
17   S3: mmmm, I don't know.
18   T: Well, let's come up and look at it because, you're right but you've got to be
        able to explain it to me. (17:00)
        Mrs. Dee and student get up and move from desk to chart on the whiteboard.

At the beginning of the dialogue, Mrs. Dee and S3's attention are both directed at S3's

palms (lines 6, 7, 8, 14, & 15). S3's hands are the object of their attention and provide a

physical manifestation of their interpersonal communication. A significant shift in attention-focus and interpersonal communication occurs after line 18 when the teacher and student stand next to the problem. This interpersonal communication evolves into an intrapersonal mode for S3 to understand and make meaning of the math problem.

In Example 16, the teacher and student have moved to the white board from S3's desk to view the problem closely. At S3's desk, Mrs. Dee and S3 demonstrated a "palms up" gesture approach to solving the math problem. A shift in S3's gestures occurred while focusing on the problem near the board.

Example 17
1M.1 Day 15 (15:40)
19   T: One hand, show me one hand. [**How** many fingers are on that hand?]
T: Mrs. Dee deictic point to the chart and haptic touch to each part. Touches the number 1, the word hand, fingers, and the number 5 on the chart.
S3: Brings left hand, palm up with fingers extended, out in front of her just below shoulder level

20   S3: Five
21   T: [So **one hand**] [**five** fingers.] [The next number under hands is what?] On the chart has what number?
Index/deictic pointing to word "hand" on chart, then moves to next column and points/touches number 5. She moves her finger in a downward motion from the word at the top to the number she states.

22   T: [**The next** number under hands is what?]
Points with right hand index finger back to the hands column one level below the "1"

23   S3: Two
24   T: Show me [two han**ds**].
25   *S3: Lifts both hands up, palm facing towards the board in the same direction she is looking, T is to her right*
26   [**And** how many fingers does the chart say there are?]
T: Index finger continues to point to the number "2"; and then moves hand to the next column to the number "10"
S3: Continues to hold up two hands with palms facing the chart at chest level away from self.

27   S3: Ten
28   T: Is that right? Okay
29   S3: [I **think** there's ten fingers.]

*Turns palm back towards self while answering the question and then faces them
back towards the chart.*

30   T: So that's right. Okay. So if you have two hands you have ten fingers,
according to this chart. [**What's** the next number?]
Index finger points to the number "3"

31   S: [Three]
*Right hand still has fingers extending but is now perpendicular to the chart and
her body and is pointing towards the three.*

32   T: Three what?

33   S3: Hands

34   T: [**Want** to borrow my hand?]
*Places her left hand, palm up, adjacent to S3's two hands, which are palm down.
T's right hand index finger continues to point to the three.*

35   S3: *Shakes head up and down "yes"*

36   T: Okay. [So three **hands]**, [how many **fingers**?]
*Points and touches with right index finger "hands" in the left column; then moves
to the right column and points/touches blank space under the "fingers" column*

37   T: So three hands, [**how** many fingers?]
Points with right index finger to the blank part of the table

38   S: [**Z**ero]
*Brings in all extended 10 fingers and closes both hands. (The space for the
answer was blank)*

In lines 19-22, S3's hands and fingers perform index pointing and iconic gestures

touching and representing numbers. In lines 23-29, evidence of an intrapersonal

communication switch occurs when S3 no longer displays her hands for her teacher but

instead faces her palms towards her focus of intention, the problem on the board. Upon

answering Mrs. Dee's question in line 29, S3 momentarily turns her palms back to facing

herself and her teacher but then returns them to facing the board. In lines 34-38, S3 was

loaned a hand by Mrs. Dee. Mrs. Dee turns her left hand palm up for S3; however, S3

keeps her hands palm down, differing from Mrs. Dee and from the open palm up pattern

they had established earlier at the desk (lines 1-18).

In example 17, Mrs. Dee and S3 literally use each other's hands and fingers to

produce a comprehensible answer. Although S3 originally came up with the correct

answer, Mrs. Dee took her through a more embodied process to help her make meaning of the fill-in-the-blank chart. As a result, a face-to-face interaction between the teacher and the student turned into a dialogue where gesture was used in an interpersonal communication modality. As a response to S3 not being able to explain her answer, Mrs. Dee created a dialogue that embodied it by using gestures as a focal point of the process. In this case, the hands became the teaching artifact to facilitate communication of the content.

Findings of this task demonstrated both intrapersonal and interpersonal processes visible through gesture. Both Mrs. Dee and S3's hands provided a visible manifestation of their steps in solving the problem. Meaning for the two participants was made available through the pointing and guiding by Mrs. Dee and the coordination of the task requirements to the physical display of the hands by S3.

Bedtime Pantomime

A unique finding in the random selection scene provided evidence of an intrapersonal communication gesture being taken up and becoming part of an interpersonal dialogue. In lines 26-30 in the random sample scene, S8 non-verbally replies to a question not intended for him, which demonstrated a response beyond the typical pattern found in the IRF recitation activity (see Figure 6). In this example, S8 performs a gesture function that deviated from all the other gestures in the task.

Example 18 – Random Sample Scene
(Day 3, 2A.3 - 16:53)
018   T: [She said the hour **first**.] [**Good** job.]
        T: Deictic pointing to hour, gives a quick thumbs up synchronized with "first";
        Moves into a high-five palm out emblematic gesture;
        S15 & T: Both slap hands

You were [thinking and listening to people yelling out. So the time is going along, don't we wish the day went this fast, and we're stopped. And now//, S17?]

T: Moves minute hand around the clock to the eight o'clock position

019   *S8: Performs a dramatization of "laying down to bed" motions to answer Mrs. Dee's question. He sees eight o'clock and places his two hands vertically palm-to-palm together and leans his head/face on it in a horizontal position, which represents the pillow. He then lays his head and hands onto his right leg, which represents the bed.*

Figure 6. Line 19: S8 palm-to-palm

020   S17: It's eight o'clock
         Hand raised
021   T: It is [**Eight**] [**o'clock**.]
         T: Points and touches 8; Points and touches 12
         S8: Finishes his going to bed pantomime and lifts his head up
            [Did, **S2**], did he say the hour first or the minutes?
         Points index finger at class and beats down when pointing to S2
022   S2: the hour
023   T: He said the hour first. [Okay, so here goes the time, it's moving around, S8 remember what you said about what happens at that time because I want to come back to that, okay?]
         Moves the minute hand around the clock a few times, slows to almost a stop while addressing S8. From Camera #2 we view that Mrs. Dee's head and vision was directed towards S8's bedtime dramatized gesture answer and she is now acknowledging it

During this time learning IRF dialogue, S8 is not called on to answer the question but

displayed attentiveness through his demonstration of meaning in relationship to where

Mrs. Dee places the clock's hands. Upon seeing the second hand on the eight and the

large hand on the "o'clock" twelve position, S8 pantomimes a series of iconic

representation gestures forming a dramatized narrative for the answer. His placement of

hands and leaning his head gently on them represented a pillow and then he laid his

pillow and head onto his knees. This dramatization allowed him to answer the question

although he was not called on in the task. In addition, his response to the question pattern

transcended the typical answer requiring the terminology hour number "eight" and

"o'clock". S8's answer brought in a significant idea related to his life. The meaning

behind his dramatized gesture mode included what eight o'clock *means* to S8 beyond the

practice. In line 19, S8 signals that eight o'clock is bedtime. Mrs. Dee having observed

S8's dramatization, acknowledged S8 after responding to the selected student (line 23)

and told him "remember what you said", referring to the answer he produced through

gesture. S8's gesture provided enough context and meaning that Mrs. Dee actually

referred to it as "what you said" although he didn't actually say anything. Whereas, other

answers spoken out of turn throughout the entire practice were never officially accepted,

S8's answer was fully accepted and acknowledged by Mrs. Dee. Instead of receiving a

corrective response for breaking the IRF turn-taking pattern, Mrs. Dee stated the desire to

use it at a future time. A response by S8 when there was no elicitation or invitation for

one and his presentation to no one in particular demonstrated a transfer from an

intrapersonal dialogue to one that developed into an interpersonal dialogue.

In contrast, in line 15, the entire class responded before Mrs. Dee selected the student:

Example 19
014   T: It is Five o'clock; she did a fabulous job. [Did she **say** the hour first] or the
          minute.
          Presentation gesture, open palm towards S15, hand points towards S15

015   Class: Minute, minute, hour, hour
       No one, including myself, realized that she quickly pointed to S15. At ½ speed
       time I was able to see that she quickly pointed to S15. Hence, the class took up the
       response
016   T: [I'm asking **S15.**]
       Index finger pointing to S15
017   S15: Hour
018   T: [She said the hour **first**.] [**Good** job.]
       T: Deictic pointing to hour, gives a quick thumbs up synchronized with "first";
       Moves into a high-five palm out emblematic gesture;
       S15 & T: Both slap hands
           You were [thinking and listening to people yelling out. So the time is going
           along, don't we wish the day went this fast, and we're stopped. And now//,
           S17?]
       T: Moves minute hand around the clock to the eight o'clock position

        Mrs. Dee used their response only as a reminder to the student to not listen to their

shout-outs but to come up with their own answer. In this IRF activity students were not to

talk out of turn and when it occurred the selected student to respond was encouraged not

to use the other students' answers. The use of gesture by S8 transcended this entire mode

of practice and allowed for a meaningful answer, which did not break the pattern of the

task. The production of gestures in a dramatized mode by S8 provided a completely

different answer with a completely different meaning compared to the answers in the

practice that reinforced a nomenclature correlated one-to-one word equivalent answer.

Transformation of Task and Activity

        The use of gesture, both spontaneous and planned, provided a modality for teaching

and learning that often changed or transformed the course of the assignment. Activities

were usually started in a verbal channel with gesture use increasing according to the

language challenge Mrs. Dee encountered with the students. When the teaching process

became a more embodied one, a transformation of the activity occurred.

Realization of Embodied Answers

In the math solving problem between Mrs. Dee and S3 (examples 15-17), the process of using hands and fingers extended well beyond a traditional finger counting exercise. As Mrs. Dee and S3 engaged in their dialogue about the answer, a transformation of the approach and mode of displaying the solution evolved into an embodied meaning-making experience. The activity changed from a written at the desk answer, to an embodied and shared intentionality between the participants and the task. Gesture created a new mode for solving and displaying the answer to the problem. As the task came to an end, Mrs. Dee was aware of the modality change and made an overt explanation of how S3 could learn from this situation:

Example 20
1M.1 Day 15 (15:40-19:20)
53   T: So [**when** you see charts like this]
        Right hand index finger was pointing to "hands" in left column and then she extends all the fingers with palm towards the chart and moves it in a circular motion over the entire chart three time;
          [sometimes you can **use**]
        Metaphoric gesture brings hands in front of self and Student with palm up, fingers extended and makes grasping/closing motions
          [your **own** self to figure it out].
        Turns hands from grasping and closed to two open palm gestures with fingers extended; Circles her hands, up and down, around the torso of her body and then puts them out towards S3
54   All right. So go circle that number. (19:20)

While saying "your own self to figure it out" (line 53), Mrs. Dee provided a series of gestures concerning the process that was just demonstrated. She gestured towards the board and metaphorically captured or held the problem by circling over it 3 times. She then brought the problem closer to her body showing her palms to S3. In a continuing

motion she moved them up and down in front of her body, and clinched her hands into fists as a metaphor for where to find the answer and how to grasp it.

Another example of transformation demonstrates a shift from casual conversation between students to an embodied mathematical strategy for discussing the number of students missing with Mrs. Dee. In this dialogue, S17 tried to subtract the number of students missing by counting backwards from the usual total number of 18 in the class.

Example 21
1M.1 (Day 2) (29:27)
01 S17: I think there are 16 people. I counted backwards; I skipped 18 and 17 and ended [with **16**.]
Places index finger over mouth, students become quiet
02 T: And [if we had only **two** people absent], [**you** would be right but we actually seem to have four we have,
Two fingers extended down at lap level (horizontal plane) then deictic pointing on second stroke towards S17. Then lifts four fingers up above lap.
  S1, S13, S3, and S14]
Begins to single out each finger in conjunction with the name of the child. The left hand fingers are all spread apart but she groups them together and counts them off with her right hand as she states the names of the students who are absent.
03 T & Ss: [And **S7**]!
She goes back to the original spread out 5 fingers, palm facing her, when she realizes that they all forgot S7.
04 T: [**So** start at 18 and let S17 do this.
Pointing at S17 with left hand index finger
(30:08)
05 S17*: Puts hand out with 5 fingers extended to count down from 18*
06 T: [Shhhh], [////////]
Touches S8 on the shoulder with right hand; Puts both hands next to her cheeks and opens mouth wide in shocked look; Places index finger over lips. She manages the shout-outs from other students with non-verbal gesture - a "shocked look"- and then finger over the mouth.
07 S17: Fourteen?
Looks at fingers and then looks up to respond
08 T: Very close. You were going to start at 18 [and **count** backwards.]
Places left hand out with five fingers extended and palm facing self. Deictically points at each finger with her right index finger. Mrs. Dee performs a reflective gesture practice. Palm is towards self not the student. Demonstrates how they should do it.

[So do **that**, eighteen,]
Five fingers still out, pulls one finger back down to her palm
09   S17: Ten, eleven, twelve, eighteen
10   T: Oh, no [////]
She sees that he is counting up and quickly puts both hands over her mouth with fingers perpendicular to lips
11   T: [**So** if I was counting backwards, S17, I would do it this way, eighteen, seventeen, sixteen, fifteen, fourteen, thirteen.]
Places left hand out in front with palm facing self and all five fingers extended. Then pulls each and bends each finger into her right hand as she counts down starting at seventeen.

In this dialogue, both the teacher and S17 used a gesture approach, where fingers represented numerical digits, to discuss and count numbers and individuals, demonstrating gesture's function for joint-attention, interpersonal communication, and a transformation for solving the problem. The gestures were not only used for interpersonal meaning but also functioned as mimetic and prolepsis strategies by Mrs. Dee. In line 3, Mrs. Dee provided fingers-as-numerical-digits gestural strategy, with her left hand and refers to them deictically with her right hand, drawing S17's attention to it. Previously, S17's assertion (line 1) lacked any visible strategy for counting backwards. S17 only provided a tentative statement concerning the number of students. However, the introduction of gesture by Mrs. Dee turned a transition time dialogue, into a mathematical problem solving space. The introduction and rise of gesture provided an affordance for the student to use that may have been unavailable in the speech modality.

In summary, both examples 20 & 21 demonstrated interpersonal functions that where joint attention frames between the teacher and her students provided a foundation where tasks gained embodied forms to achieve solutions. Example 21 provides evidence of how gesture assisted in tracking numbers and coordinating names to the numbers. These gestures provided multiple affordances to assist S17 in accomplishing the task that was

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not necessarily considered by the student. In this case, a casual dialogue between students transformed into an embodied math solving exercise. In example 20, a fill in the worksheet, at the desk activity, turned into an embodied strategy for not only solving this particular problem but to actually teach its perpetual use in the future. Indeed, Mrs. Dee concluded the problem-solving experience with S3 by trying to teach her about embodied answers (line 53). Correspondence with Mrs. Dee confirmed her intentions to teach students about coming up with answers during tests. She explained that physical manipulatives are not present during tests but that students can use themselves to answer many of the questions. As a result, a math problem that was to be done at the student's desk in written form was changed into an embodied solving-practice near the board where spaces were touched and multiple hands were used to not only answer the question but provide a problem-solving strategy for future use.

Research Question #2: How Does the Use of Gesture Mediate Learning of the Second Language?

In chapter 3, studies concerning the use of gesture as a meditational tool for learning a second language were reviewed. Many of the same results in those articles appeared in this study. In addition, gesture use that has been given less attention for learning a second language was found in this study. Although the focus of the video and audio recordings of the data were centered on the teacher, gesture initiated by the students was often reproduced by her, or other participants, to further communication, content, and meaning-making. In particular, activities where gesture production transformed the task and was provided the possibility to grow and develop into different communication and language

possibilities were found to be a rich source of meaning-making for the students. Gesture was found to assist in supporting comprehension and use of vocabulary in more meaningful processes in both interpersonal and intrapersonal functions, as it clarified definitions, heightened phonemic awareness, supported personal narratives, and conceptualized mathematical language.

The following section is divided into four categories: (1) Establishing joint-attention, (2) Interpersonal and intrapersonal communication in relation to vocabulary and content development, (3) Genesis & transformation of activity and task, and (4) Diffusion of content. These sections contain the majority of examples (22-50) that answers question two: How does the use of gesture mediate learning of the second language?

Establishing Joint-Attention

Partner Reading

Children's constructions of interaction with language, people, and objects in a second language, often come in pieces that are not necessarily hierarchal or linear. In a triadic relationship of joint-attention between one's voice, a social partner, and a goal-directed activity in a L2 setting, any part of this triad may take a prominent role in the learning and development of the second language. The integration of voices between participants and their object or objective of focus, includes the sharing of attention carried through pointing, mutual gaze, or verbal modalities. In this second grade classroom, joint-attention was found to be a particularly important part of learning a new culture and language. One example of joint-attention and intentionality between two students occurred while reading an insect book written in English at one of the reading stations in

the classroom. During this reading, both used their L1 Spanish, to help them work

through a challenging non-fiction text.

Example 22
Day 7 2M.1 4-21 (1:50:34)
01   S6: …yo lo doy el zapato.
             …I'll kick it.
         [Ahora mira **esta**. Te puede matar.]
          Now look at this one. It can kill you.
         Points with right hand index finger and touches a bug image on the page. Book is
         sitting mostly on S15's lap, so S6 has to reach across his own and S15's body
         from his right side to touch the bug on the left page of the book.
02   S15: [**Espera**.] [Se puede **esta**]. [Puede morder **sangre**]. (1:50:41)
        S15: Hold on. This one can. It can drink blood. (1:50:41)
        With his right hand, he waives his hand over the page with a back hand waived
        towards S6 as if to move him out of the way; Points and touches a different bug
        with his right hand; Then points and touches S6's first bug. Turns the page
03   S6: Haber. Quiero checar esa atrás.
        S6: Let me have it. I want to look at the one in the back.
        Grabs the corner of the book and starts to pull it towards himself
04   S15: [Spear. Espera.] Mira. Mira. [Aquí **está**] debajo de la tierra.
              Wait. Wait. Look here at this one underground.
        Slides his hand next to S6's and pushes his hand off the book; With his right hand
        index finger, he points and touches a bug image in a tunnel under the ground;
        Turns the page
05   S6 & S15: [A **ladybug**.]
        S6 points at a ladybug on the next page and both students say "ladybug" at the
        same time

    In this example and their ensuing reading of the text, joint-attention constructed

through the gesture modality, played a strong role in allowing the students access to a

non-fiction insect book written in English. In this early stage of learning to read in

English, gesture played a critical link between content in the book and the joint-attention

and efforts of two students to access this literacy. The conversation between the two

students concerning the content of the book was centered on the initiation of gesture.

Through deictic pointing, the students were able to communicate attention and

intentionality concerning the images in the text. This provided the students concrete and shared objects, allowing them an affordance where meaning and perception could be shared. It is possible that an effort to read a difficult text out loud may not have met their needs to make meaning of the text.

Small Group Reading

On a daily basis, Mrs. Dee called groups of three or four to her table for language arts that included spelling, phonemic awareness, vocabulary, reading, and comprehension activities. Textbooks, reading books, worksheets, computers, and objects were some of the literacy tools used to engage the students in language learning. The teacher used gesture as a guide to view the awareness of the students' attention and to draw awareness to specific words and intentions of the practice. Throughout these activities, students demonstrated perception of the words and raised multiple questions concerning the meaning of words. In the following example, Mrs. Dee helped the students identify the author's recommended vocabulary words in a reading concerning the Ferris wheel.

Example 23
(Day 6 1M.1- 24:12; 3M.1-27:54)
01   T: And, Uhm, There are a couple of words [in **bold**, are you ready?]
         Points to and touches the bold word
            [and I, uhm, want you to remember that when words are bold, the darker
            letters,]
         Continues to point to the bold word before instructing students
            [can you put your fingers on one of the darker sets of letters, okay, where else,
            there's another word in there. Good, S1 found it.]
02   *Ss (S1, S6, S11): Students point and place fingers on bold words in text*
03   T: All right, so when an author put words in bold, they want you to take extra
            special attention to it. [So **what** is one of the first words in bold?] (3M.1-28:23)
         Points and touches word in text

In lines 1-3, Mrs. Dee used deictic and haptic gestures in an attempt to direct the students' attention towards the bold words to be learned. Mrs. Dee's gesture occurs before she directs the students' attention verbally. The students demonstrate attentiveness and perception of the words both verbally and non-verbally. Their actual touching of the bold words demonstrated their attentive focus on the word, which allowed Mrs. Dee an ability to assess their comprehension and attentiveness to her instructions. The prescribed content to study was in bold and direction was given verbally to look at them but the joint attention to them was performed in the gestural act of pointing and/or touching them. Mrs. Dee's use of gesture for joint-attention development established a starting point for the continuing dialogue (see defining vocabulary, examples 29-31). Mrs. Dee provided an embodied assessment of where the students' attentions were and a way to unite them in a shared and concrete starting point. A point and touch of the bolded words provided the students an embodied form of seeing what Mrs. Dee expressed as needing "extra special attention".

Phonemic Awareness Activity

Mrs. Dee used a color-coded group spelling system with students divided into four levels that more closely matched their abilities. The groups spent roughly thirty minutes a day with Mrs. Dee at a small table near the back of the room. During all phonemic awareness type of activities, Mrs. Dee focused on making meaning and comprehension of the words presented in the reading exercise. This included correct phonemic pronunciation and an understanding of the definition of the word. In the following example, Mrs. Dee used a practice common in most early elementary grades, called "Blending". According to Yeh (2003), two critical skills for young children to acquire to

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assist in early reading ability are blending and segmenting. Blending refers to matching the correct phoneme to each letter in print and putting them together. Segmenting refers to stretching out pronunciation in hopes of allowing each printed letter to be heard in a distinct and identifiable sound. In the following examples (24-27), a mix of blending and gesture was initiated and implemented by Mrs. Dee and the students as a meaning-making strategy for the words on a list as they sat around the reading table at the back of the room.

Example 24
 (3M.1 Day 2) (17:40)
01 T: [The **way** that you're saying it is great]
  Points to S11 with right index finger extended just below chin height
   [because you **put** those sounds together]
  Both hands are apart at chest level with fingers pointing towards each other, then she brings hands together by sliding and interchanging fingers from each hand.
   [where they're **only** making one sound.]
  Hands are held apart and then clapped together, palm to palm in a holding hand grip, where the four fingers are together and holding the other hand, with thumb coming around the other side of the hand
  [So we've got "**b**", "**r**", do that,] /
  Places right hand out in a closed fist form; Places left hand out in a closed fist form.
02 S16 & S11 & T: ["**b**", "**r**"; "**b**", "**r**";]
  T: Extends right hand out, palm open fingers extended; Extends left hand out, palm up and open, with fingers extended; repeats the same gesture for each sound
  S16: Places left hand slightly after Mrs. Dee with palm down and fingers pointing towards her open palm up hand; He then presents an open palm facing Mrs. Dee at the same time as her left hand stroke with eyes focused on her hands movement
03 T: Use your hand,
  (Looks at S15)
04 Ss & T: "**b**", "**r**", now put them together, "**br**". Now you don't say ["**b**", "**r**", "**at**"].

Example 25
Day 2: 1M.2 & 3 4-13 (01:56:00–Viewing Teacher) and 3M.1 4-13 (1:20:55-Viewing Students)

01   T: And then, let's look at the next pattern; the next pattern is a "c" and a "r" together. So let's do the thing with our hands together again, are you ready?

02   [What sound does **"c"** make all by itself?] [**c**] (sound),]
T: Right hand presented w/ fingers apart to her right with elbow on table and hand at shoulder level; beats hand down on the sound of c

03   *S15 & S16: Mimics/mirrors Mrs. Dee using their left hands palm up presentation corresponding to her right hand*

04   *T & S15, S16: Beat gesture: All three beat their hands down as part of the phonemic "c" answer producing both a simultaneous answer to the question*

05   T: [How about the **r**?]
Places her left hand out, palm up at chest level

06   Ss: "r" (phonemic sound)
S15 & S16: Place right hand out palm up mode and then sound out r sound

07   T&Ss: [r] (sound)

08   T: [Now put them **together**]

09   *T&Ss: Clap their hands together just below chin level*

10   Ss: [cr] (sound)

In lines 1-10, Mrs. Dee leads the students in a hand movement exercise of combining sounds together. She assigned and placed the sound of "c" in one hand and the sound of "r" in the other. As the two hands combine, the individual phonemic sounds of "c" and "r" are combined to make a blend. The students continually followed Mrs. Dee with gestures occurring in this same fashion and in a synchronized time. This pattern was also established for "fr" in lines 49-53 and "dr" in lines 63-66 as shown below:

Example 26
(1M.2&3 - 4:38)

45   S16: [**r**] / [**fr**]
Places right hand palm up at chest level to his side, then places left hand palm up at his other side; Brings them together

(Skip to 49)

49   S16: fr ,r, [**f**], [**f**] [**fr**] (phonemic sounds)
Places left hand up at head level with elbow on table with fingers slightly curved in a holding form; Places right hand up at head level with elbow on table with fingers slightly curved in a holding form; Brings both hands together at chin level and interlocks fingers in a clasping of both hands

[**Says** fr, fr]
Points and touches word on paper
50   T: You did that perfectly. [You made the first sound, **f**,]
Places her right hand out, palm up below shoulder level
        [you made the second sound **r**,]
Places her left hand out, palm up
51   *S16: Places both left and right hands out at shoulder level to each side of himself*
        at the same time as Mrs. Dee's left hand placement
52   T: [you **put** them together] [**fr**.]
        T: Claps both hands together below her chin;
53   *S16: Claps both hands together just after Mrs. Dee*

Example 27 (skip to 71)
71   T: All right, now let's look at the next one. Just connect, that's our next pattern.
        It's a d, r
72   S15: dar
73   S16: [**dr**], [**dr**]
        Places both hands together following the phonemic gesture pattern for the BR
        blending motions but clasps both hands quickly together; Repeats this motion a
        second time.

It should be noted that in the later two cases, it is a student who initiates the pattern

originally established by the teacher. The movement provided the students a visible and

physical manifestation for carrying and combining the sounds together. This afforded

both the teacher and students a visible imagistic and oral/aural assessment. In Interview

1, Mrs. Dee clarified the impetus for the practice of combining sounds by hand, as being

initiated by the students. She had seen the students doing it before the study ever occurred

and decided to follow their pattern. So although the video shows the teacher as

introducing the gesture strategy for combining sounds, it is important to note that she

claimed the students introduced this gesture before this particular activity.

In examples 25 - 27, "br", "cr", "dr", and "fr" demonstrated the same findings of

holding the phonemic sounds in each hand and physically bringing them together. One

slight exception to the full extent of the pattern was the dialogue concerning "fr". The "f"

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and "r" blend is only part of the dialogue as a result of being introduced by S16 and was actually out of Mrs. Dee's teaching sequence. As a result, we do not see it as fully developed as the others in Mrs. Dee's dialogue. Mrs. Dee does acknowledge S16 for his phonemic gesture production but does not continue with the dialogue pattern as seen with "br", "cr" and "dr". In addition, following examples 25-27, the activity included the sounds of "g" and "r" with a focus on the word "grab". The "gr" blend was also another example that followed the pattern of holding phonemes in separate hands and bringing them together. Once this was established, a space was provided for the students to create definitions. All examples contained a series of gestures in a dramatization of the definition and a sharing of personal experiences to them before the group moved on to the next word. The transition in gesture from a representation of holding sounds to a more complex dramatization of personal experiences provided context and meaning for the activity, which will be discussed in 5.6.2 - *Interpersonal communication and personal narratives,* examples 33-38.

Story Reading Time

Mrs. Dee and the students had story reading time, on almost a daily basis. During this activity, it was common to see Mrs. Dee point out characters and objects. This joint-attention strategy often instigated a higher level of student engagement, resulting in multiple student comments, questions, and personal experiences. According to Mrs. Dee, "book discussions enhance language development" (Interview 1, 22:02). In the following group reading time, Mrs. Dee delivered an embodied reading experience of *Chicks and Salsa* to the students. She began the reading by turning to the title page containing an illustration of the book's characters.

Example 28
(1M.6, 4-15 16:48)
01   T: Wow. There's a lot going on in this picture.
        [I see a woman sitting **outside**] [with a **lemonade**,]
        Right index finger points and touches the top of the woman and circles her entire
        body; Points to the lemonade glass and runs right index finger on the page from
        bottom of glass to the top and then back down to the bottom.
        [**taking** a rest,]
        Moves hand away from the page and presents it palm up towards the students
        [her **eyes** are closed,] [**but**]/ [**while** she is resting,]
        Points at the eyes; Points at the lounge-chair the woman is on; Spread out 5
        fingers in perpendicular to the palm of her hand pointing and covering most the
        woman's image
        [the **pig**] [is **stealing** her sandwich.]
        Points and touches the pig; Points at the sandwich on the table near the sleeping
        woman
02   Ss: (laugh)

The reading continues with the same pattern of pointing to characters and objects to

gain a joint-attention frame with the students. The gesture pointing and dramatization of

accompanying explanations and personal narratives allowed a sharing of the text that

would have been difficult if at all possible through the verbal channel. Her deictic points

allowed students to engage with the text. Indeed, as the activity continued, students

referred to their own lives, animal experiences, and also pointed at parts of the text Mrs.

Dee had not addressed. Mrs. Dee's gesture use provided a shared foundation, which

created a rise in engagement with the students. As students engaged with the text both

verbally and gesturally, a shared understanding of the meaning they were making became

visible, just as Mrs. Dee demonstrated. The sharing of attention on particular pieces of

the text and illustrations provided a foundation for the next step, which was usually more

enhanced interpersonal communication.

Interpersonal and Intrapersonal Communication in Relation to Vocabulary and

Content Development

Gesture accompanied many interpersonal and intrapersonal dialogues, which

contributed to further language use and content development. This section displays

gesture's function as a meditational tool for communicating interpersonally and

intrapersonally, to further language and content knowledge. Gesture's use for

interpersonal and intrapersonal communication was centered on the search for meaning in

the language regardless of the content subject.

Defining Vocabulary

A search for meaning, such as vocabulary words usually dominated any language arts

activity. A typical reading and spelling session often began with a pre-reading vocabulary

activity or phonemic awareness task introduced by the teacher. After the initial

instructions, which usually included joint-attention sharing strategies, Mrs. Dee and her

students often addressed new vocabulary words or questions from the text. During these

vocabulary challenges, the use of gesture was implemented to assist the teacher and

students in defining and comprehending new words. The following example is centered

on the word, "vast". In this situation, a reading group made up of three students met with

Mrs. Dee at the reading table at the back of the room. They are using a basal reader and

referring to the prescribed bold words.

Example 29
(1m.1, 24:35)
04   *T & Ss: Teacher and students are pointing to the word "vast"*
05   S6: V$\bar{a}$st (veIst)
06   T: There is no e at the end of it or other vowel so it's got to be a short vowel.
07   S6: Vast
08   T: Vast, remember what vast means?
09   *S6: Shakes his head "no" side to side*

10   S11: A vast crowd
11   T: Vast, Crowd, hmmm, [let's look at the **picture.**] Does that help?
       Points back at the picture with her right index finger
12   S6: [Yeah, **people** were all over, were walking all over,/the,] [// **the**/]
       Starts with both left and right fingers on page of book; then takes them off and
       puts both hands on the side of his head as he struggles for a word
13   S11: It's crowded
14   T: Very crowded, so vast is another word for huge, so they could have said huge,
       a huge crowd, a humungous crowd, [but vast means something that **takes** up a lot
       space.]
       Arms/hands/fingers extended horizontally as wide as possible, extending out on a
       horizontal plane from the shoulders
15   S6: [Like, **like**, one **thousand** people?]
       Student mimes teacher's previous gesture with extension of arms/hands/fingers to
       a full stretch from side to side with hands just above shoulder level; He then
       lowers both hands down a few inches in a beat gesture
16   T: I think more than that
       S6: Continues to hold arms and hands completely stretched out from his body side
       to side at shoulder level
17   S6: [A **zillion** people?]
       Continues with arms/hand/fingers outstretched with fingers extended away from
       himself with a quick lowering of his hands just a few inches in a beat gesture
18   T: I think close to that but not a zillion
19   S6: But that's a lot of people
20   S11: Two million?
       S6: Still holding arms out and then puts them down as teacher begins to talk
21   T: Two million, [I don't even **know** how many people were there], it's actually
          something you could find out
       Moves both hands below the chin with palms facing her body and then presents
       open palms with both hands moving towards her shoulders
22   T: So it says a vast crowd, [**what's** the next word?]
       Points to next bold word with right hand index finger on the page of the book
       (1M.1:26:34; 3M.1:29:24)

Mrs. Dee's use of deictic pointing gestures (lines 1-3) was the central act for a joint-

attention frame between herself and the small group. The joint-attention act provided a

shared starting point from which further meanings could be made. After this act, both the

students and teacher produced iconic gestures (lines 11-20) to gain meaning of the word,

"vast". From this concrete act, both participants presented gestures to make meaning of

the modifier "vast". In this example, "vast" is an adjective with indefinite properties or

boundaries. To provide meaning to this word, Mrs. Dee (line 14) provided an extended

arm gesture starting from her body and extended out in opposite directions away from her

torso. Verbally, the words, "thousand", "zillion", and "million" were used to find a

boundary, albeit limited in descriptive meaning of the crowd it was modifying. The

extended arms, hands, and fingers coincided with the indefinite properties of the word.

The gesture expressed meaning in both the distance in space from a given point, and the

continuous indefinite modifying definition of the word. In this embodied definition, the

person stands as a starting point from which the hands began and extended out to define

"vast." The enactment and extension of fingers allowed both the teacher and students a

physical, kinesthetic meaning of two aspects found in the definition of the word.

A similar interaction of gesture and speech was found in a one-on-one assessment

activity between Mrs. Dee and S15. In Example 30, Mrs. Dee is checking on

comprehension of a reading passage with S15, one of the most recent immigrants in the

class with less than one year of English experience. In this situation, S15 knows the

content for the response but does not recall the particular vocabulary word in English. To

demonstrate meaning and elicit communication, the student turns to gesture.

Example 30
(Day 27 5-21: 3M.2 5-21 (4:35))
01   T: [What are they doing **here**?]
        T: Points to picture in book
        S15: Points and touches the same place on the page with right hand index finger
that   *Mrs. Dee pointed at*
02   S15: [He doing, **take** his hand, like this]
        Right hand is above the book and perpendicular to tabletop with fingers together
        and extended towards Mrs. Dee; Shakes hand up and down a few inches above
        the book
03   T: [Shaking, **we** say shaking hands]
        Puts her right hand out and shakes hands with S15

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04   S15: yeah/// They jump////// [They're playing **soccer**^]
         Left hand comes up to head level with palm of hand in a shallow cupping shape

S15's gesture (line 2) is performed with an interpersonal cooperative implicature that is

taken up by the teacher. They join together in shaking hands and S15 receives the lexical

answer he requested.

    In contrast, four minutes later, the same gesture was used during a different

assessment sequence. In this part of the dialogue, the book is closed. As the assessment

started, the student was fingering the edge of the book and Mrs. Dee told S15 not to look

at the book. He quickly put his hands under his legs at that point. The S15 then

commenced to answer the questions but struggled to say more than one answer, "they

play soccer". Mrs. Dee then began a series of questions to elicit further information

concerning the reading. Again, the student turned to gesture but this time it was orally

accompanied with the vocabulary word elicited by the earlier extended and shaking of the

hand S15 had shared with Mrs. Dee.

Example 31
(Move to minute 9:18)
05   T: Tell me some of the things that, [**some** of tricks that the dog could do?]
         *Places left hand out in a presentation gesture towards S15 with palm up just
         above table top*
06   S15: [**Shake** his hand]
         *Shakes his right hand - the same hand as min 4:35 with request and assistance
         from teacher (Example 30, lines 2-3)*
07   T: mm, hmmm
08   [S15: and **jump**///]
         Puts right hand in a fist and moves it up from mid-chest level to upper chest level
            play soccer ///
09   T: Okay. What did Jim say to the dog?
10   S15: ////////////
         Sits w/ hands tucked below leg
             Good // dog
11   T: Okay, uhmm… How did the story end? //// (whispers to another student)
         [**Doesn't** matter] ////////////

> *Puts both palms up at shoulder level*
> You're not sure?
12   *S15: Shakes head "no"*

Example 5 demonstrates the role of gesture playing a function for finding a word and demonstrating its meaning. S15 was not aware of the vocabulary word "shake" yet was able to communicate his intention to his teacher. She understood his intention and shared meaning through completing a hand-shaking gesture with the student while at the same time stating the name for it. Approximately five minutes later, during the assessment time without the book, S15 performed the same gesture and was able to recall the terminology for it.

In the first demonstration of the iconic/emblematic gesture for shaking hands, the student performs it with an interpersonal intention. His gesture was received and reciprocated by Mrs. Dee, forming a joint-attention moment. Five minutes later (line 6), S15 was asked to recall information from the book and performed the same gesture when using the word "shake". In this second use, the gesture played an intrapersonal function without an intention to elicit a response from his teacher. As a result, Mrs. Dee did not provide her hand as previously occurred in their interaction (line 3). By shaking his hand, S15 was able to provide a demonstration of his intention and meaning of the text to Mrs. Dee and to himself. Although the same gesture was deployed twice and a few minutes apart, Mrs. Dee understood the meaning of both S15's presentations. One solicited interpersonal assistance; the other provided intrapersonal assistance for meaning-making of the answer, with no intention for Mrs. Dee to engage with the gesture.

Interpersonal Communication and Personal Narratives

Personal narratives are often ways in which new members are socialized into larger

existing communities. In an effort to better understand the interpersonal dynamics of this

classroom the use of gesture with personal narratives was analyzed for its ability to

enhance interaction and communication between the teacher and learner. Mrs. Dee and

the students often shared personal narratives or self-disclosed information about

themselves, which invited similar replies from other participants. Findings from the data

showed that students replied with further questions or their own personal narratives when

hearing Mrs. Dee's personal narratives or self-disclosure. During floor reading time,

Example 32, is a continuation of the story reading time dialogue based on the text *Chicks*

and Salsa. Mrs. Dee sits in her chair in the corner of the room and holds the book up with

her left hand so that she and the students can both see the pages (see Figure 7 & 8).

Example 32
(Day 4, 1M.6 - 16:48)
03   T: [Now this gives,**/**]
        Moves right hand to her chest with all five fingers spread out
          [when **I** look at this picture,]
        Moves right hand away from chest and waives a student's hand down and
        continues it back to her chest area
          [**I** have a text to **self** connection]
        Points and touches the center part of her chest with all five fingers slightly curved
        out from the palm; Moves hand away from chest and towards the book, pointing
        with her index finger
          Because [when I have been **outside**] [with food on a **//,** close to me,]
        Circles right hand around the page with fingers pointing at the page; Curves her
        right hand fingers to make a horizontal plane with fingers pointing and touching
        a small table in the picture. The right hand fingers are held flat and horizontal to
        her lap with arm running vertical - this gesture fills in the missing lexical piece at
        the pause marks, which includes a double-beat during the pause

Figure 7. Line 3: Ellipsis of table

Figure 8. Line 5: "Winston took"

      [I've had **dogs**] [take **it**.]
Extends fingers and moves hand away from her chest; then quickly closes/snaps the fingers and hand into a fist back towards her chest

04   S?: Winston?

05   T: [So this is a **pig**] [taking **it**,]
Points toward the pig with fingers extended; Turns wrist and pulls all fingers into a closed fist and moves it from the book back to her chest
     [but when **I look** at this picture,]
Spreads out all five fingers and does two circles around the size both pages
     [**it** reminds **me** of a time when **Winston** took] a sandwich from me./ We're going to read, put your hand down.
Moves index finger to the right side of her head, and touches her temple area; then holds index finger out away from her head pointing straight up at the ceiling; Then turns and bends her hand at the wrist and points all fingers out towards the students and closes the fingers together into a fist and pulls the hand, wrist first, back towards her chest area.

Mrs. Dee displayed a pattern of moving from deictic gestures and a monologue

introduction to responses that replied to a student's comment and provided a short

narrative of her life (see Figure 8). Mrs. Dee encouraged the students to use text-to-text,

text-to-self, and text-to-world strategies while reading. A chart on a wall provided these

terms and definitions, and it was not unusual for Mrs. Dee to refer to personal narratives

as part of the dialogue for making meaning of the text (line 3).

Another demonstration of gesture use shifting from a joint-attention focus to

developing interpersonal communication and content development occurred in the

phonemic awareness practices (see also examples 24-27). In the following examples, the

continuing dialogue between Mrs. Dee and the students included interpersonal language

and personal narratives to help define a list of words on paper and make meaning of the

content. After Mrs. Dee and the students referred to phonemic sounds such as "cr" and

"dr", gestures continued to play a central part in the development of interpersonal

communication, personal narratives, and definitions (see Figures 9 & 10). After

embodying the phonemic sound of "cr" through clapping both hands together, Mrs. Dee

asked them questions about the word itself. The students made the following

interpersonal statements, including personal narratives to express meaning of the word,

"Crab". Examples 33 and 34 demonstrate two students' gestures and personal narratives

for making meaning of the assigned word during the phonemic awareness exercise.

Example 33
Day 2: 1M.2 & 3 4-13 (01:50:00–Viewing Teacher) and 3M.1 4-13 (1:21:14-Viewing Students)
14   T: S11?
15   S11: It's an animal that lives in the sea-d and it's [**red, //**]
        Left hand fingers are slightly apart and move up and down imitating a crab's walk, performed at her side, at shoulder level near her chin, quickly and subtly
16   T: They often are red, aren't they, [uh, hu**hmmm**]
        Points at S16 with left index finger
(Skip to line 23)
23   S11: When I lived in Cuba with my grandma and my family, when we went to the beach, when we were, when we were going home, a crab, a crab bit my, my grandma [in the **foot**,] a baby crab.
        Repeats her previous crab walking movement (line 14) with fingers going up and down, very quickly and subtly

Example 34
17   S16: [And they go **under**][**water**,]
        Moves right hand from reaching above his head, to a five spread out finger motion extending from below his chest area towards the teacher parallel to the table; left hand is placed above the right arm during the motion coinciding with the words "under water"
            and sometimes they [**snip** your nose]

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Has both elbows on the table and hands up and out in front of his face and pinches fingers and thumb together with both hands on his nostrils

Figure 9. Line 17: "underwater"

Figure 10. Line 17: "they snip"

[and in the movies//]
Releases his nostrils and opens both palms up vertical to desk top at head level
[they **snip**,]

18   *T: begins to mimic S16 by using both hands as pinchers/claws with all fingers pinching down on the thumb at chin level in front of her face between her and S16*

19   *S16: Mirrors Mrs. Dee and pinches his fingers together like a claw at the same time as her, they share the same pinching beat a couple of times*

20   T: I would so not want a crab to snip my nose

21   S16: No, in the movies
        Points at teacher (to correct her)

22   T: Oh, only in the movies, okay, good. Yes (Cam.1.M. 2&3 (0:02:40))

In these two examples, both students shared explanations and personal narratives concerning the word they were given during the phonemic awareness exercise. S11 developed a personal narrative accompanied by gesture concerning crab; although, it was not used by the others. S11 produced a definition (line 14) and personal narrative (line 20) concerning crab with the up and down, extended finger motion. This personal narrative not only revealed information about where she lived, her relatives, and activity

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but also illuminated the *movement* of the crab through her gesture production, an aspect of the narrative not readily revealed through the verbal channel.

In the two examples above, the focus of activity turns from phonemic awareness to making-meaning of the words with a context that contained relationships to the students' background. In lines 16-18, S16 defined crabs in a hypothetical, yet personal manner. His personal connection is developed and represented by the iconic and metonymic gesture representation of pinchers. Line 16 contains his use of the pronouns "they" and "your" in connection to seeing them in the movies. Yet Mrs. Dee's first reaction is in joining S16's gesture performance by mimicking the pinchers immediately and before S16 has finished his statement. A joint production of the pincher gesture occurs and then the verbal misunderstanding is corrected. Mrs. Dee's understanding of S16's statement was revealed in the personal remark "I would so not want a crab to snip my nose" (line 17). This was corrected by S16 as having occurred "in the movies" (line 18) revealing a personal attachment S16 has made between crab and a movie he has viewed.

Mrs. Dee and S16 also develop interpersonal communication concerning the word crab by implementing a gesture modality. It is important to notice that they both pinch together at the same time (lines 18-19) and this is also repeated again a little later in the dialogue (line 30).

After discussing crabs with S11 and S16, Mrs. Dee turns her attention towards S15. At this point, she repeats the pinching gesture to elicit interpersonal communication and understanding with S15; however, a language challenge ensues. The following example begins with a comment from Mrs. Dee concerning poisonous crabs. As seen below, Mrs. Dee corrects him and then moves her attention towards S15.

Example 35
29   T: I don't think, I don't think crabs are poisoned, no. [**But a crab** definitely has
            claws.]
        *Repeats crab claw pinching motion in front of S15. She pinches both hands open
        and close 3 times*
            [Do **you** know a crab?]
        *T: Turns towards S15, points to S15 and then repeats the claw pinching motions
        with fingers and thumb coming together on both hands at shoulder level*
30   *S11 & S16: Both repeat the claw pinching gesture*
31   S15: Yeah
        Unlike S11 & S16, there is no motion at this time with his reply
32   T: [Do you know the word for crab in Spanish?]
        Continues to pinch with her hands
33   S15: Hmmm, ///I don't know
34   T: I'm looking, I have a dictionary in Spanish// S8, do you, is there a Spanish
            dictionary next to you, [**by** that white notebook?]
        *Looks around at her shelf and the shelf by S8 then points with left hand index
        finger at shoulder level towards the bookshelf near S8*
35   S8: Right here?
36   T: Next to that? Is there a Spanish Dictionary? It's yellow and blue, no, okay,//
            thank-you.
        S16: Uh, uh, what was I going to tell you?
37   T: I don't know. [All right, so this **word** is crab.]
        Points to the word with her right index finger
38   S15: I see, [I see **crab**]/// I see one and I eat it.
        *Places fingers and thumb together before closing hand in a holding/pinching
        motion*
39   S16: [**Ohhhh**,] (fake cough, fake cough)
        Points at Mrs. Dee with right index finger
40   T: They're delicious to eat aren't they? So I'm glad, you do know what a crab is.
            Next look at the next word that fits in with this word pattern (1:22:52). S18, turn
            around.

In this section, Mrs. Dee initiated the shift in dialogue by checking for understanding of

the word crab. The responses contained both speech and gesture form. S11 orally

provided a general descriptive definition of crab and included a gesture of moving fingers

at her side representing a moving or walking crab. S16 demonstrated interpersonal

dialogue by taking up S11's comments through the conjunction "and" (line 17) by

including a crabs potential to "snip your nose" (line 17). At this point, the student

initiates an iconic gesture representing claws metonymically for the word crab, through

its ability to pinch. This metonymic representation is displayed again in lines 29 & 32

when Mrs. Dee checks for understanding with S15 on whether he understands the

definition of crab.

Mrs. Dee produces the pincher gesture to S15 (line 32) and it is important to notice

that S11 & S16 respond with a pinching of their fingers but this gesture is not taken up by

S15 and is accompanied with the reply "hmmm, I don't know" (line 33). Although S15

had responded in the affirmative that he knew crab (line 30), he made no gestural

movement that would be considered an interpersonal communicative act. Lacking an

answer similar to the others, Mrs. Dee discusses the use of a Spanish-English dictionary

and searches for one. After failing to find it, Mrs. Dee repeats "crab" and S15 responds

with a smaller pincher gesture, using one finger and thumb, and a self-disclosure about

eating them (line 38). Having had all three students respond to the meaning of the word,

Mrs. Dee continues the pattern of using gesture for developing a definition and personal

meaning making of the next spelling words, "drip" and "drag".

Example 36
3M.1 Day 2
74   S15: I mean dr
75   T: dr, and [you figured out the first **word**, what is it?]
        Points at word on S15's list with left hand index finger
76   S15: drip
77   T: drip
78   S16: drip
79   T: Anyone know what a drip is? S16?
        S16 & S11 raise their hands
80   S16: [A **little** sink] [and uhmm, **it's dripping** water]
        Places both index fingers together at top of head height and extends them out
        from each other in small curved motions running down vertically by bringing both
        fingers back together and then apart, with fingers touching every few centimeters

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at a lower point. Fingers are following the outline shape of a drop; S16 continues to performs fingers together and separating in small curves and coming back together twice, which has moved from upper head height down to shoulder level

81   T: Okay, do you know that?
        Shaking head up/down – yes style
82   S15: No
        T: Grabs a small white board at the table and begins to draw a faucet with drops coming out
83   S16: Agua, e agua, una, ohh, una sink, [agua **spraying out**,] I can't say so Spanish
        S16: Hands at face level, horizontal to desk with palms down, and flaps hands up and down motion in alternating fashion
        T: Finishes drawing a picture of a faucet with water drops coming out on the small white board and turns it so it faces the students
84   T: So this is a drip,
85   S?: It's water
86   T: [and water comes out of **the**,/ faucet,] [**drip,**] [**drip**,] [**drip**]
        Open palm up w/ fingers extended at eye level and she place her hand down towards the board at the opening of the faucet and closes the fingers together to demonstrate coming out of the faucet; then points to picture and lifts index finger at eye level and down onto the board beating out drip 3 times.
87   S15: Ohh
88   T: Okay
89   S16: Sometimes I don't know how to say Spanish.

In lines 79-86, both students and teacher changed their focus from an oral/aural phonemic practice to the creation of the drip definition. After asking the students, S16's answer (line 75) becomes the basis for Mrs. Dee's definition. She draws a picture of a faucet and sink and then physically mimes the actual drip from a faucet to the bottom of the sink by creating iconic drop forms by bunching all five fingers together, pulling them down from the faucet and then performing a beat gesture for the drop, by beating her index finger 3 times on the white board.

A similar pattern of moving from joint-attention and phonemic awareness to more dramatized productions of gesture are produced for the word "drag" in lines 91-94. In the following example, a dramatization of the word is produced when S16 doesn't distinguish the difference between two words.

Example 37
3M.1 Day 2
91   S16: Drag
92   T: Drag. How about drag?
93   S16: That's the same one on the top
94   T: Drag, isn't, well, look it has the same letters except, you're going to have to be
          careful when you take your test. [This is a **b**, brag,]
        Points to "b" on list with right hand
          which means to talk really nicely about someone. And drag, [would be, to pull
          something, I'm going to **drag** the pen across the table]
        *Places a pen to the right of her on the right edge of the table and pulls it - sliding
        it across to the left side of the table in a very exaggerated motion with her body
        leaning to the right, as if the pen had a lot of weight and she had to put a lot of
        effort into pulling and dragging it to the other side.*

In this dramatized gesture sequence, Mrs. Dee grabs the pen at one end of the table with

both hands and arms extended as if the pen were heavy, leans towards it and pulls it

across the desk with her entire torso moving from one end of the table to the other.

    The data displayed Mrs. Dee originating gestures to clarify definitions of terms that

seemed beyond the students' language level. The use of gesture played a prominent role

in the multiple language challenges needed to make meaning of the words in the

assignment. One possible reason for sharing personal narratives and dramatized

definitions was to convey an invitation towards unity or cohesion between participants'

background knowledge. Another possibility for the development of personal narratives

was to provide students a space where they could develop greater depth of meaning and

clarity to possibly challenging vocabulary or language tasks. Findings show that Mrs.

Dee's primary concern is on the students making meaning of the word with time and

effort spent on discussing and modeling the word rather than on phonemic accuracy.

    Mrs. Dee performed a variety of personal narratives during this activity. When

explaining the word "drag", Mrs. Dee turns to her home life and her experiences with her

dog to bring meaning to exercise. Continuing with the scene at the reading table with a

list of words, Mrs. Dee helps the students make meaning of the word, "drag".

Example 38
90   T: You could go home and ask your mom. That would be a great thing she could
help   you with. So we have drip. How about the next word?
91   S16: Drag
92   T: Drag. How about drag?
93   S16: That's the same one on the top
94   T: Drag, isn't, well, look it has the same letters except, you're going to have to be
            careful when you take your test. [This is a **b**, brag,]
        Points to "b" on list with right hand
            which means to talk really nicely about someone. And drag, [would be, to pull
            something, I'm going to **drag** the pen across the table]
        Places a pen to the right of her and pulls it/slides it across to her left side of the
        table in a very exaggerated motion with her body leaning to the left, as if the pen
        had weight and she had to put a lot of effort into pulling/dragging it to the other
        side.
            and usually, I use drag when I talk about Winston. I have to drag Winston over
            to the middle of the yard to give him a bath. [Means I'm grabbing hold of **him**]
            [and I'm dragging him.]
        Both hands and arms are fully extended to her left. She grabs hold around the
        dog's neck round holding with both hands with fingers and thumbs making a
        circular shape; Grimaces while she pulls to from her right side of the table to the
        left. Her entire body shifts from her right to left as if she needs to put all her
        weight into dragging.
95   S16: Are you, Are you pulling his tail?
96   T: [I, uh, **put** a leash on him.]
        Places index finger and thumb around the front of her own neck
            I am not pulling his tail because that would be mean.
(1:26:12 & 7:07)

In this dramatization mode, Mrs. Dee uses a series of iconic gesture to demonstrate

herself, her dog, and the "dragging" motion when trying to give the dog a bath. As

mentioned in Examples 13, 38, and Interview 1 & 2, Mrs. Dee's personal narratives about

her dog are consistently repeated as a theme to provide context for language exercises. In

this case, Winston the dog and the accompanying "dragging" motion, brought a lively

experience, which drew attention to a particular word and provided contextualized meaning during the language challenge.

Mrs. Dee's dog, Winston, was a rich point in narratives that was consistently used throughout the entire study. Through correspondence with Mrs. Dee, she explained that she used Winston, as a topic or example for many writing assignments. She shared that the stories were basically true but sometimes she purposefully created Winston stories to address the needs of the students. She found that time and place of Winston's activities did not seem to deter from the point the stories made. Indeed, she explained that some stories had been used in past years of teaching.

In the next example, Mrs. Dee provided the students with a preplanned personal experience to model and establish meaning to an extended writing assignment. Mrs. Dee sat in her chair in the corner of the room and wrote on the easel near her, "I gave Winston a bath" as a model for writing a story. Mrs. Dee's strategy of displaying a lack of description and detail in her one sentence story, provided the students with a question and answer activity as seen below.

Example 39
1M.4 Day 7 (19:56) (21:07:10)
06   T: S12?
07   S12: uhm, uhm, what did Winston do when, when you gave him a bath?
08   T: It was not good.
       Shakes head "no" while smiling
       Uhm, Winston doesn't like water so much. And even though he is a water dog.
09   S?: Huh?
10   T: Like part of his, the kind of dog he is, is a dog that would usually go swimming and like water. [He **has webbing** between his toes] [**to help** him swim.]
       Spreads right hand fingers out and points to the skin connecting the fingers with her left hand index finger with palm facing self; Turns hand palm down, cupped, and goes into a paddling motion at her side.
       [Like you were talking about **S7**]

Points to skin in between finger area with her left hand pointing at her right hand with palm facing self

but he gets, [I **pulled** the hose out] [into the **grass**]

Pantomimes grabbing something with her right hand extended away from her body, closes fist, and pulls towards her body. Left hand with palm up slides under the right hand when the pulling comes in to her body giving the pulling a floor (grass) base.

[and he **saw the hose**] [and he **ran** away.]

Points to her eyes and then pulls hands back to hose position gesture; Makes fist with thumb sticking out and points thumb and hand towards the area behind her

[And he **wanted** to go in the house]

Waived hand horizontally away from her chest

[and **he went** over to the house] [and he **pushed** the door open] [and he **went** inside.]

Places both hands on nose; Turns both hands out so nose comes through and hands have turned from palms facing her nose to palms facing out towards the students still near her nose; Right hand moves in front and away from her body at face level with palm out moving up above her head.

Figure 11. Line 10: "he **pushed** the door open"

Figure 12. Line 10: "and he **went** inside"

[So now I'm out **in** the grass and I have the **hose** and I have **no dog**.]

Presentation gesture with open palm and beats 3 times

[So then I went into the **house.**] [**S5** put your hand down.]

Presentation of right palm up at mid-body level; Waives S5 down with palm facing down at head level and then going down to leg.

[I went into **the house**] and I got **Winston** and he didn't want to come.

Places right palm out, repeating previous line; Uses both hands to grab an area to her side

[And I had to **pull him**] [and he pulled **back**] [and I'm pulling **forward.**]

Brings both clinched hands from away to closer to her chest; Leans back in chair and extends arms and hands in clenched holding gesture and performs a rocking

motion with her arms and body back and forth. Pulls arms toward her while pulling body away from chair in coming together gesture.

11   Ss: (Laugh) That's Tug –of-war
12   T: And this is me, pulling on Winston, and this is Winston.
Draws a stick picture of herself and Winston with leash with both of them leaning in opposite directions on the easel white board next to her
13   Ss: (Laugh) That's tug-a-war
14   T: All right? [So Winston is **pulling back** and I'm pulling.]
Leans away from chair with arms and hands extended out and then leans back into the chair
And he weighs about 100 pounds.
15   Ss: Oooohh
16   T: And// he wasn't moving, and, but I won. Anyways, I finally stopped pulling on him and I was gentle with him. [And he **likes** to be scratched behind the ears.] [So I scratched him behind the ears and I said, '**Come on** Winston, come on, let's go outside'.]
Performs the scratching gesture with right hand behind her right ear; Waves hand towards self as she talks to Winston.
[So he went **outside**]
Performs sliding motion with hand holding door handle and sliding the door open or closed.
and he saw the hose and he wasn't so happy again. [And then I **turned** the water on,]
Iconic gesture of grasping water handle and turning it in circular motion
And he rears, when he's [really **nervous**,]
Lifts both hands up in front of her chest and fingers quickly spread out and come back together in a quick out motion and then quickly closes fingers back together
like with the water. He does this. Here's the ground. [//**He** goes up on his legs.]
Draws picture of dog standing on hind legs; Puts both hands up in the air and leans back in her chair while hands continue to go up and back

Figure 13. Line 14: "**pulling** back"   *Figure 14.* Line 18: "rearing **up**"

17   S?: Like a horse
18   T: [**Right**, like a horse], exactly like a horse. So there was Winston, [rearing **up**]
       Points at student with right index finger; Then raises both hands up together
       above her head in a leaning back (rearing) motion, with palms facing out towards
       the class
       and not wanting to be washed. [And here was **me**] [with the **hose,**]
       Points to picture of self with left hand index finger; Brings hands back in front of
       self and uses hand in grabbing, partially closed fist and holding motion.
       and anyway, I had to talk to him. (0:23:36)

Although the narrative sharing was decided previous to the lesson, a level of

spontaneity occurred because of questions the students asked and in the actual speech

formulation of the experience. The shared experience seemed to flow with few language

challenges; however, close observation of the video showed a variety of vocabulary

words and multiple shifts of voice and stance, including the opinions of the dog. Words

such as "webbing", "hose", "lean", "rear" and "rearing" were possibly beyond many of

the students' English vocabulary knowledge. Mrs. Dee goes into a high form of

dramatization, including drawing pictures, to overcome language challenges and convey

the meaning of her message to the class.

In embodying meaning, Mrs. Dee not only represented herself but also took

Winston's point of view, enacting the dog's body parts and movement. These register

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shifts and vocabulary words were not formally taught at this grade level or addressed in a standardized strategy to assist students in understanding narratives. Instead, the rise of gesture provided both the teacher and students a meaning-making process for presenting and engaging with the narrative.

Preplanned personal narratives shared by the teacher throughout the study were always accompanied by the production of multiple gestures to carry meaning to the students. This story of Winston was only one in a series of personal narratives Mrs. Dee applied as a strategy for modeling stories to the students. In Interview 1, Mrs. Dee explained that students in the past have always enjoyed hearing stories about her dog. The narratives are usually true but sometimes fictional. Regardless, she usually purposefully placed them within the lesson as a model for the students to follow. Observation of the students' casual conversation about the dog throughout the study led me to believe that they had met the dog. Mrs. Dee shared that some classes had in past years, but this one had not.

The particular story contained pieces that were not necessarily part of the students' daily life. During the study, Mrs. Dee asked how many of the students lived in homes and how many lived in apartment buildings. All of them said they lived in apartment buildings. Gesture in the story provided a clarification of specialized vocabulary particular to the narrative that may have been outside of the students' daily routine. It allowed for meaning to be shared and comprehended, although some vocabulary and activity may have been beyond the students' current experience or schemata. This classroom's use of personal narratives demonstrated a new register beyond the teaching

instructional language. This register was typically more personal and portrayed opinions, stances, and aspects of their cultural identity.

Genesis and Transformation of Task and Activity

Phonemic activity and English Superlatives in Math

As part of early grade elementary classroom norms, phonemic awareness strategies are traditionally implemented regardless of whether the students are L1 or L2 learners. Typically, the focus of phonemic awareness activities is on oral/aural practice. However, in this classroom, more time was spent on definitions and meaning-making than just verbal exchanges. As a result of the implementation of gesture in the activity, a shift from a verbal pronunciation practice and assessment, turned into a pattern for making meaning. In examples 25-27, the sounds of "cr", "br", "fr", and "dr" were initiated as typically found in phonemic practices. However, Mrs. Dee's practice followed a pattern of embodiment by phonetically introducing sounds, checking for comprehension, and discussing or presenting definitions in extended dialogue. All three of these phases demonstrated an exchange of a dramatization of meaning or personal narrative. In the following example, Mrs. Dee's and the students' gesture pattern transforms a practice from being a focus on oral/aural processes to a dialogue centered on definitions and comprehension. One example can be seen in following Mrs. Dee's dialogue with S11 & S16 during small group time at the back reading table. A list of words was provided for the phonemic practice but a focus on meaning-making becomes central in the dialogue.

Example 40
Day 2: 1M.2 & 3 4-13 (01:50:00–Viewing Teacher) and 3M.1 4-13 (1:20:55-Viewing Students)

01   T: And then, let's look at the next pattern, the next pattern is a "c" and a "r" together. So let's do the thing with our hands together again, are you ready?

02   [What sound does **"c"** make all by itself?] [**c**] (sound),]
T: Right hand presented w/ fingers apart to her right with elbow on table and hand at shoulder level; beats on the sound of c

03   *S15 & S16: Mimics/mirrors Mrs. Dee using his left hand palm up presentation corresponding to her right hand*

04   *T & S15, S16: Beat gesture: Both beat the hand down as part of the phonemic "c" answer producing both a phonemic and non-sounding simultaneous answer to the question*

05   T: [How about the **r**?]

06   Ss: "r" (phonemic sound)
S15 & S16: Place right hand out palm up mode and then sound out r sound

06   T&Ss: [r] (sound)

07   T: [Now put them **together**]

08   *T&Ss: Clap both hands together*

09   Ss: [cr] (sound)

10   T: [cr] (repeats sound with students)

3M.1 Day 2 (1:21:10)
      So the first word is// crab

11   Ss: Crab

12   T: Anybody know what a crab is?
S11 & S16: Raise hands

13   T: S11?

14   S11: It's an animal that lives in the sea-d and it's [red, **//**]
Left hand fingers move up and down imitating a crab's walk; it was performed at her side, quickly and subtly between her chin and shoulder area

15   T: They often are red, aren't they, [uh hu**hmmm**]
Points at S16 with left index finger

16   S16: [And they go **under**][**water**,]
Moves right hand from reaching above his head to ask to be called on to a five spread out finger motion extending from below his chest area towards the teacher parallel to the table; left hand is placed above the right arm during the motion coinciding with the words "under water"
    and sometimes they [**snip** your nose]
Has both elbows on the table and hands up and out in front of his face and pinches fingers and thumb together with both hands on his nostrils
    [and in the movies//]
Releases his nostrils and opens both palms up vertical to desk top at head level
    [they **snip**,]
T: begins to mimic S16 by using both hands as pinchers/claws with all fingers pinching down on the thumb at chin level in front of her face between her and S16

S16: Mirrors Mrs. Dee and pinches his fingers together like a claw at the same time as her, they share the same pinching beat a couple of times

17   T: I would so not want a crab to snip my nose

(Skip to line 20)

20   S11: When I lived in Cuba with my grandma and my family, when we went to the beach, when we were, when we were going home, a crab, a crab bit my, my grandma [in the **foot**,] a baby crab.

Repeats her previous crab walking movement (line 14) with fingers moving up and down, very quickly and subtly

This pattern was also evident for the other words on their list: Brag, Brat, fr, drip, drag, crop (Day 2, 3M.1, 1:20:00). An oral/aural exercise was accompanied with gestures that carried meaning to the creation of definitions and use of the word in personal narratives. The germination of gesture's use from correlating directly to the phonemic blending practice to one that provided meaning to the teacher's and students' lives demonstrated a significant shift in the practice itself. Indeed, a considerable time was spent on defining and presenting dramatized modes of making-meaning of the words than actually practicing the attachment of phonemic sounds to pronounce the words.

Another example of transformation of activities through gestural processes occurred during a group instruction concerning mathematical language. As a result of current national and state foci on raising scores on standardized tests of math, Mrs. Dee decided to provide students with practice questions and strategies directly related to performing well. About a week before a nationally required norm-referenced test, one of the practices implemented was an embodied form of learning some superlative terminology of "most" and "greatest", in comparison to "least", "smallest" and "fewest". These terms are conceptual and abstract in that they hold an extreme position on some type of continuum or series, which is often not well defined. Typically, the comparative and superlative forms are used to show the difference between two or more objects in English. The

superlatives used in this practice began in the more traditional form of comparison, which

in this case was the use of "manipulatives" – color-coded shapes of hexagons, pentagons,

squares, trapezoids, rhombuses, and such. This practice strategy lasted for about 10

minutes and then Mrs. Dee warned them that the test makers wanted to trick them. She

explained that they were doing this in an effort to "helping us learn something that might

be tricky" and that "We want to outsmart the test" (Cam. 1A.4 5-6; 0:36:30). She then

expressed that she was going to try and trick them. She started the next phase of the

activity by referring to the manipulatives on the floor but her change in terminology from

"fewest" to "least" presented a challenge to a student. As Mrs. Dee sat in a circle on the

floor with manipulatives in front of her for all the students to see, the following dialogue

and activity took place.

Example 41
Day 16: 1A.4 (0:40:35)
01   T: Which shape has the fewest? S6?
02   S6: The, uh, blue ones
03   T: [Okay, and who can **remember** the name of the blue ones?// S18^?]
         Closes left hand into a fist with thumb extended just above leg level as she sits
         cross- legged on floor
04   S18 & other Ss: Rhombuses
05   T: [Rhombuses. **The** rhombuses have the fewest.]
         Points to the Rhombus row with fingers touching the ground at the bottom of the
         row
            Which, sit criss-cross, which shape has [the **least?** ////////]
         Right hand is hanging over the right knee and she turns her hand palm up with
         fingers in cupping shape
06   Ss: Pentagons, Trapezoid, Rhombuses, Squares,
         Some raised hands
07   T: And I'm not going to call on any one making noises at me /// can you just put it
            down on the floor.// Gentlemen!// S13?
08   S13: The squares. *(a wrong answer)*
09   T: Okay. The word that I used was // least,// right? Which one has the least? [The
            word least is another **word**] [about // **fewest.**]

181

Teacher is sitting down and raises her left hand as high as her head with fingers and palm facing out and towards the ground and places her right hand closer to the ground with palm facing up. The arms and hands are apart and come together at her chest level with palms coming together. She repeats this gesture a second time.

At this point the practice shifts from tangible and countable pieces on the floor to a gesture focused form for the superlatives. In example 42, from line 10 to the end of the practice, gesture was relied heavily for joint-attention focus and as an evaluating means for the teacher to assess. The genesis of the gesture occurred in the practice once manipulatives were no longer used. Eventually, this germination of gesture completely replaced verbal responses with a total reliance on gesture as the communicative exchange by the students to Mrs. Dee.

Example 42
(Skip to 0:41:50 and 3A.3 - 0:43:08)
010   T: [So get your hands **out.**//]
        Slaps left hand over right hand, palm to palm at chest level
            [Make them **touch**.]
        T: Lifts left and right hand apart a few inches and places palms back together.
        Ss: Students slap their hands together; Some continue clapping
            We're going to make our hands move, I didn't say clap or make noises.
        T: Keeps hands together in front of her chest; then turns the palms up in a "desperation" or "giving up" expression when students are making noise. She places the hands down on her legs.
011   Ss: *Some students clap in rhythm*
012   T: // No. ///[/ **Okay**, put your hands together,] we're not clapping, //stop./
        Places both hands together, palm to palm in front of chest parallel/horizontal to the floor
            When you are talking about the most, your hands should be as big as you can make them. Say most and move your hands.
013   T & Ss: [Mooo**ost**]
        Teacher and students extend arms and hands away from each other with arms and hands extending to their fullest reach and bottom hand extending to floor. O vowel sound is exaggerated and held as long as it takes for the students and teacher to extend the arms and hands.
014   T: Now we're going to go down, fewest.

015   Ss: [**Fewest**]
T: Brings hand back together palm to palm as students speak
Ss: Arms and hands come together slowly as students exaggerate the
pronunciation of "fewest", a drop in pitch also occurs in many voices

016   T: Greatest

017   Ss: [**Greatest**]
T: Moves hands away from each other with left arm and hand extended above her
head and right arm and hand placed down to the ground. No exaggeration of
word pronunciation.
Ss: Move hands away from each other with left arm and hand extended above her
head and right arm and hand placed down to the ground. Again the pronunciation
of the word is exaggerated according to the time it takes to completely extend the
hands and arms.

018   T: [Le**ast**]
Brings arms and hands back together at mid-chest area and puts palms together
with left hand over right hand. There is no exaggeration of word pronunciation.

019   Ss: [**Least**]
Bring arms and hands back together at mid-chest area and put palms together
with one hand over the other.

020   T: Alright, I said the words and moved my hands, and now you're going to say the word, I'll say it and you say it. (42:39).

021   T: Most

022   S: [**Most**]
T: Moves hands away from each other with left arm and hand extended above her
head and right arm and hand placed down to the ground. No exaggeration of
word pronunciation
Ss: Move hands away from each other with one arm and hand extended above
their head and the other arm and hand placed down to the ground. Again the
pronunciation of the word is exaggerated according to the time it takes to
completely extend the hands and arms

(The practice pattern from lines 10-22 continues in similar fashion in lines 23-70. After line 33, Mrs. Dee does not necessarily alternate but sometimes switched to superlatives with the same meaning, such as using fewest and then little, causing no switch in the gesture. This was performed as a type of "trick" and also as a joint-attention assessment)

In this classroom dialogue, Mrs. Dee centered her instruction in iconic gestures,

which provided students one type of definition for words associated with a most/least

superlative comparison. Mrs. Dee transformed the practice into an embodied learning

activity, including gesture as the primary form for learning the language concept. The use

of gesture allowed Mrs. Dee a method to define multiple words belonging to the same

conceptual category. This transcended the need to define the words verbally or nuanced

differences between them. The extended and closed hands and arms gesture carried the

conceptual meaning of all the words they would see on the day's assignment.

Student speech also declined during the last third of the practice to such an extent that

in the last two tasks, there were no verbal responses. In the last 6 floor-time exchanges, a

range from only two student to no student verbal responses occurred resulting in gesture

being the dominant and only channel for answering Mrs. Dee's questions, as shown

below:

Example 43
059   T: Most
060   Ss: [**Most**]
      Most students keep arms apart; some students put their hands back together; student laughter/teacher smiles
061   T: Least
062   Ss: [**Least**]
      T & Ss: Move hands back together, palm to palm, in previous pattern performed earlier in this practice (lines 10, 15, 18, & 19)
063   T: Greatest
064   Ss: [**Greatest**]
      T & Ss: Move hands apart, arms extended in previous pattern (lines 13, 17, 22); Everyone is doing the extended motion together but only a couple of students are still verbally saying the words.
065   T: Most
      Continues to keep hands apart, arms extended in motion pattern
066   Ss: Most
      Almost all students keep hands apart, arms in extended pattern; only a couple start to put them back together but quickly correct themselves and pull their arms back apart
067   T: Good job! //
      Continues to hold hands apart, arms extended in motion pattern
      Smallest
068   Ss: [**Smallest**]
      Ss & T: In unison, move hands back together, palm to palm, in fewest motion pattern performed earlier in this practice; only hear one or two students orally saying the words
069   T: Least

Continues to hold hands back together, palm to palm, in "least/fewest/smallest" pattern performed earlier in this practice

070   Ss:
No one repeats the word at this point. Everyone looks around to see if anyone mistakenly pulls their hands apart; only one student verbally states the word; they catch one student pulling his hands apart and laugh and point at him

Gesture ended up being not only the main mode but also the only mode of response by the students (lines 68-70). In addition, the activity changed from a recitation situation, where Mrs. Dee asked questions of the students and assessed their responses, to one that resulted in a joint-attention performing display. The math language learning task turned into an embodied practice that allowed for multiple responses and assessment to be made through a visual manner. In addition, the transformation of the task into the gesture channel facilitated the production of a game playing situation. The task turned into a game when Mrs. Dee used different words from the same conceptual category. As shown below, this caused the students to display the same gesture two times in a row, promoting a tricky change from just switching between two gestures.

Example 44
032   T: Least
033   Ss: [**Least**]
T & Ss: Bring arms and hands back together at mid-chest area and put palms together with one hand over the other. Still a little exaggeration of pronunciation length
034   T: Let's just say the word, okay
Still holding palms together with left hand over right
    Least
Continues holding palms together with left hand over right
035   Ss: [**Least**]
Ss: Move hands away from each other with left arm and hand extended above her head and right arm and hand placed down to the ground. Again the pronunciation of the word is exaggerated according to the time it takes to completely extend the hands and arms
036   *T: Makes a face and scrunches her lips together*

Uh, oh, / unh, unhh, // [**least**]
Presents hands, palm to palm, and extends it away from her body

As Mrs. Dee displayed "tricks" in her gestures (lines 33-70), the verbal responses decreased (68-70). Student attention became more focused on their imitation of the teacher and on the other students' responses. When two students missed the gesture answer, they smiled in realizing their mistake while the others laughed and pointed. In this case, the usual definition of comparing objects to obtain the extreme type on a continuum was not used. Instead, the use of gesture provided them an activity that liberated them from the manipulatives and usual question-answer process found during floor time. The last two task displays and responses were predominantly gesture based with the last task being a literal self-pat on the back by the teacher.

In review, the activity was begun on the floor with plastic manipulatives to demonstrate difference in size between the groups of pieces per shape. The activity began as an IRF practice but the addition of gesture changed the practice into one where the entire class could participate at the same time. Gesture's prominent role in representing the conceptualized answer resulted in the students responding and demonstrating their answers non-verbally in the end. In addition, classroom correspondence with Mrs. Dee demonstrated that she was aware that using gesture as a pedagogical tool provided the students with a tangible form for solving problems during future tests when plastic manipulatives would not be available.

Diffusion of Content

    English Superlatives in Math

After the most/least floor instruction, the students went to their seats to work on their math problems. The math assignment for the day contained word problems that resulted in the students having to make a decision between the most and least superlatives. The excerpts below occurred when the students were having difficulty solving some of the problems. An assistant teacher who had sat at a desk during floor time was now assisting the students at one of the tables. In the following examples, both students and teachers turned to gesture as a solution to the word problems on paper. The following section contains seven examples (45-51) that stemmed from Mrs. Dee's floor time use of gestures to understand superlatives (examples 41-44). The first five examples are a continuation of the gestures used by a variety of students and a second teacher, Mrs. Mee, while at their desks answering questions on a worksheet. The seventh example occurs the next day, between Mrs. Dee and S3. The diffusion of the greatest and least gestural motions begins in Example 45 just a few minutes after Mrs. Dee's floor instruction. A student, S13, struggled with a question and initiates the same gesture to an assistant teacher, Mrs. Mee (T2). Students at their desks repeated Mrs. Dee's gestures to solve their worksheet problem. The first repeat of Mrs. Dee's gesture was initiated by a S13 during a challenging problem, and was then imitated and displayed by Mrs. Mee.

Example 45
Day 16: 1A.5 (0:35), 3A.3 5-6 (55:33)
074   S13: [The **most** or a **little**?]
        Raises both arms and spreads out hands; brings hands back together
075   T2: [The **most**]

Right arm and hand is down by her side with hand parallel to floor and the left arm and hand is completely extended above her head with fingers extended and curved

076   S13: The most…

Example 46
(0:56:00) 3A.3; 1A.5 (0:1:08)
077   S6: What does this mean?
078   T2: [**Many**], [how **many** children ride after school?]
        Extends left arm above her head and right arm down with fingers curved of both hands; Points to problem on paper
079   T2 & S6: (Exchange is inaudible)
080   T2: [**Less**]
        Brings hands together, palm to palm at her waist level

Mrs. Mee, the second teacher, not only mirrored the gesture back to S6 but also produced it to four other students when they requested assistance on their word problems. There is no evidence that T2 was planning on using the more/least gestural motion to solve the problems until S6 (line 74) performed it while asking her a question. Subsequently, Mrs. Mee used the gesture to assist other struggling students as shown in examples 47 through 51.

Example 47
(0:01:57)
081   S11: Ms. Mee, I need help with this question.
        Points to question with pencil in right hand
082   T2: [Okay,// **fewest**], fewer children chose birds or turtles?
        Looks at problem, Raises both arms and hands in front of her and student and with left hand above the right one, slaps them together in the middle
        S11: Writes down answer

Example 48
(0:02:37)
083   S15 & T2: inaudible – working together at desk

084   T2: Who has [the **most**]?
        Raises left arm extended above her head with hand perpendicular to arm and right arm is extended down the side with fingers curved.
        S15: *Writes down answer*

Example 49
(1A.5, 00:03:10) (3A.3, 0:58:03)
085   S1: *Raises hand*
086   T2: Okay, let me see, what's the question?
087   S1: *Points to problem on paper; Beats it three times*
088   T2: What children choose cats or turtles? [What happened **here**?] Which one has the most? cats or turtles? [**Most**]
        Points to problem on paper; Extends left arm with hand perpendicular and curved to arm extension and right arm is at her side and her hand forms a cupping shape
        S1: *Writes down answer*

Example 50
(04:35)
089   T2: Look at it here. Did more children choose cats or dogs? /// [**More**]
        Raises left arm and keeps right arm lower in an extension shape as previously produced in the activity
090   S6: Oooh…

    The next day, Mrs. Dee followed up on S3's warm-up math work. Mrs. Dee asked S3 how she came up with an answer. After pointing to the board from her seat and getting up and pointing to the word problem, S3 explained how she came up with the answer.

Example 51 (second day, Day 17)
(Day 17: 1M.1 – 0:12:25 and 0:12:51 - 2M.1)
091   S3: I saw the word that we were talking about and it's the correct answer.
092   T: It is the correct answer, you're right. And you know what's so smart about what you did? You found that word. Can I write in here? You found that word "most" and you remembered it, you remembered [what **most** meant]
        Places both hands together palm-to-palm with right hand over left and then pulls them apart; Performance space is smaller than yesterday's demonstrations with hands starting at mid-chest area and only expanding to waist and shoulder area.

and you knew that you had to look, you remembered what most meant. That's perfect. So let's look at number two.

After the whole class math instruction floor time, six displays of the superlatives most/least iconic gesture were performed during the independent practice at their desks. An additional use was also repeated the following day for a similar math problem. The first evidence for using the iconic gesture for the "most" and "least" concept was performed by a student asking the assistant teacher, Mrs. Mee (T2) for help. The independent deskwork time had been going on for two minutes prior to S13's gesture and no iconic gestures for math problem solving had been performed during that time. The student was the initiator of the gesture during this phase of the lesson and T2 then continued to use this mode of communication to assist other students with similar problems. The iconic gestures representing the superlatives were used four more times by T2 during this practice. In addition, T1 repeats the gesture when discussing a similar concept but different math problem the next day. The following day, Mrs. Dee demonstrated the same iconic gesture representing least with S3 (line 93).

Taking a macro view of the dissemination of the embodiment of superlatives, the sharing of these gestures spread from Mrs. Dee to her students then to another teacher. The genesis of this particular gesture appears in Example 41 (lines 5-9) when a student provides the wrong answer to the teacher's question. In this instance, the teacher shifted terminology from "least" to "fewest". This change in terminology seemed to have caused confusion and hesitation in the student's response. At this point, Mrs. Dee began conceptualizing the terminology and its meaning into one iconic gesture. Germination of the gesture can be seen from Example 41 through Examples 51 on both Day 16 and Day

17. From the initial gestural instruction, we see a growing display and functional transformation of its use. In the beginning phase of the superlative gestures, the previous IRF verbal pattern of question and response between the teacher and student was followed. However this transformed into a joint-attention activity among the students themselves without verbal communication during floor time. Eventually this gesture use culminated as a tool for solving math word problems at their desks.

Day 16 math time provides the viewer with an extended example of gesture's ability to be mimed and imitated by others. It provides evidence of gesture's ability to be transferred in multiple contexts resulting in a transformation of the activity. In this case, vocabulary words for mathematical concepts, originally shared orally during floor time and associated with plastic manipulatives, were transformed into an embodied experience in instruction and a more liberated experience in developing answers during the individual assessment phase. The use of gesture brought meaning to the students by allowing them a modality to keep track of comparison terminology. It also afforded the teacher a pedagogical tool to assess the students' comprehension of the words without having to go through a recitation process where only one student could answer at a time.

Findings Review

In all, the findings, based on these data examples, suggests that gesture in this second grade ELL classroom played a prominent role in the meaning-making experience for both the teacher and students. Gesture played a central role in joint-attention sharing, directions, instructions, carrying content, overcoming language challenges, transforming the learning task, and producing space for multiple voices. Gesture use by the teacher was

both planned and spontaneously produced in an effort to concretize the language and facilitate communication. Both the teacher and students demonstrated various uses for making meaning of the language tasks and challenges. It would seem that to understand language concepts *in-vivo* the teacher and students implemented, communicated, and learned through an embodied experience. A more detailed analysis and discussion of the findings are provided in the next chapter.

CHAPTER 6

ANALYSIS AND DISCUSSION

Chapter Overview

Gesture in a sheltered-English second grade classroom as a meditational tool for

learning and as a form of meaning-making for both the teacher and students in English

was the focus of this study. Chapter five presented the major findings of this study's data

and this chapter analyzes the findings with reference to the theoretical framework and

previous studies in the area. This chapter is organized according to the function of gesture

in the classroom ecology. In review, findings for chapter five demonstrated gesture as

having a role in joint-attention, content-coordination, interpersonal and intrapersonal

communication, content development, transformation, and diffusion. I analyze and

discuss the findings for the gesture function categories in association to the two research

questions. Where similar categories are found across the two questions, I combine

analysis of them. Addressing both research questions according to categories within the

same section demonstrates the strong relationship of gesture as a meditational-tool for

making-meaning and using a second language in general classroom contexts. As

mentioned in chapter three, the age of those in the study may be more influenced by the

ecological affordances found in their classroom experience than explicit second language

acquisition pedagogical practices. In addition, English as the main language of use in the

classroom, was the underlying language for all forms of meaning-making whether

particular to subject topics or directly for English development. Specific differences

between the two research questions are addressed according to their divergences in their

meaning-making functions.

Establishing Joint-Attention

Gesture through an SCT perspective may be looked at as a sign that is part of a concrete communicative activity. Vygotsky (1997b; 1981) viewed linguistic signs as having an indicative and symbolic function. Concerning child-adult interaction, the pointing gesture by an infant, moves from an unsuccessful grasping motion or movement directed toward an object, is adhered to by a care-taker such as a parent. The parent responds to the movement providing some type of answer and intention to the child. Eventually, the child learns to respond to the parent's actions making possible the emergence of joint-attention and shared intentionality. The concept of a gestural sign providing joint-attention was manifested throughout all the days of the study. Joint-attention was manifested throughout all the examples, demonstrating gesture's central function in directing joint-attention in classroom activities and tasks.

In answering research question one, an important example of joint-attention and indexing as a form of meaning-making by both the teacher and students was found through the collection of descriptive statistics of the random sample scene. In this scene, deictic/haptic gestures totaled 40 percent of all the gestures used in just under five minutes of dialogue. Of particular interest was the lack of verbalized demonstratives that would be expected in a task of finding and telling time according to an analogue clock. Word count of the random scene, showed only thirteen demonstratives with seven actually referring to the math task and six referring to classroom management or classroom attendance issues from the past. Deictic gestures played the overwhelming role of guiding the students to both the initiating question and prompting them towards the expected answer. Results from the random sample indicate that gesture was used as a

referential sign to interpersonally communicate a shared understanding. The study as a whole reconfirmed this finding with referential deictics and haptic gestures occurring on a daily basis. This substantiates a communication pattern deemed central to more complex social interaction (Hewes, 1973; Call & Tomasello, 2007; Tomasello, 2009; Zlatev, 2002).

When gesture is used for academic instruction and in formal classroom ecologies, it takes on the dimension of *mimesis*. As mentioned in chapter 3, Donald (2001) described mimesis as "an analogue style of communication that employs the whole body as an expressive device. It manifests itself in pantomime, imitation, gesturing, [and] sharing attention …" (p. 240). Data in chapter five showed mimetic gesture as a material carrier of knowledge for both content and English. Gesture as a pedagogical tool was used by the teacher in a variety of spontaneous and purposeful ways. Regardless of whether the teacher was aware and purposefully performed a particular gesture or spontaneously performed them, both conscious and subconscious displays were in the context of teaching. Defining gesture in the classroom as only a linguistic accommodation or as just a part of the social building process, does not sufficiently explain the understanding and developing phenomena occurring between the teacher and students. However, when viewed as a mimetic process, gesture functions as a meditational tool between participants and as a superordinate mode of communication that facilitates second language learning.

With regards to research question two, joint-attention provided a concrete basis for sharing intentionality and focus on particular parts of the English language. Especially in reading, whether partners, small groups, or as a class, Mrs. Dee and the students' use of

gesture guided them in making meaning of texts and illustrations. The joint attention gestures, through mimesis, provided two major functional meanings for the participants. First, it established a mode for sharing or communicating intentions that led to more complex forms of interaction with the affordances in the classroom. Second, gesture, used mimetically, provided an external embodied meaning, which provided the means or the basis for internalization and transformation of the skill on a new level (Donald, 1991; Nelson, 1996; Vygotsky, 1978). This second point will be discussed in the transformation sections of this chapter and chapter 7.

Concerning the first point of mimesis, that of joint attention, the example of two boys reading a text beyond their reading levels provides insights as to how they commenced in their understanding and relationship to the text. According to example 22 the two students displayed a high level of deictic pointing gestures to draw joint-attention to content in a non-fiction science text. In this case, the English text was written in a more advanced level than the participant's reading abilities. To access the content and share meaning, the two students turned to gesture and their Spanish L1. This self-developed strategy allowed the students a starting point into the English written book. This follows a similar pattern found in learning to read in the L1. Senechal, Thomas, and Monker (1995) found that pointing as a form of higher participation during reading led to enhanced vocabulary acquisition. With the lack of English experience in referencing the text, the students turned to gesture as the dominant modality for directing and sharing their focus on the content they could access. Gesture as a function of joint-attention provided a foundation for future intersubjectivity and interpersonal sharing of background experiences with the content. The ability for gesture to develop the necessary foundation

of meaning that leads to transformation is discussed in the transformation section of this chapter.

Content Coordination

Counting by using fingers is common for early elementary school aged children. In chapter three, studies demonstrated children's use of fingers as numerical digits and the higher accuracy of counting through gesture by children 2-6 years old (Saxe & Kaplan, 1981; Gelman & Meck, 1983). It appears from these studies that gesture is most beneficial when children are *learning* to count but not completely proficient. Alibali & DiRusso (1999) built on these studies by adding how deictic and haptic gestures assisted the students. Their findings corroborated these earlier studies in that, gestures contributed to accurate counting performance. In addition, they also found that gestures "help children to accurately implement their knowledge of one-to-one correspondence, both by helping children keep track of counted objects, and by helping children to coordinate saying the number words and tagging the objects" (p. 54). The coordination of words and objects, as content, was a part of the affordance gesture provided in making meaning of the task. This content-coordination was demonstrated in the classroom when numerical problems arose, whether the subject context was math or not. In example 14, a casual conversation during transition time led to a coordinating task between numbers and names of students who were missing through the use of fingers. To add to the complexity of the task, the student had the desire to count backwards from 18, the total number of students in the class. This undertaking was cognitively demanding and Mrs. Dee suggested that he,

"use your strategy to get to how many we have here today"
The left hand retains the five spread out fingers and the right hand makes an arching motion and points to the left hand (Example 14, line 5)

Of particular note was Mrs. Dee demonstrating how to use "your strategy". In this case, Mrs. Dee prolepts S17 towards a particular counting down strategy through the use of fingers by assigning names to each finger and also coordinating the movement of the fingers down to counting backwards. Mrs. Dee not only orally stated how to accomplish this task, she embodied the content coordinating as an example of how to go about solving the problem.

In answering research question one, gesture as a form of meaning-making assisted in content-coordination, (Examples 14 & 15), where language issues seemed to be secondary to the mathematical content challenges in the dialogue between the teacher and students. Although the modality of communication was carried both in speech and gesture, the solution to solving the challenge of content information, coordinating names and numbers, was solved specifically through the embodied channel. The crux of communication between the teacher and student's communication was the meaning, intent, or intersubjective purpose for solving the problem. Solutions and dialogue were shared through the gestural modality.

Interpersonal and Intrapersonal Communication in Relation to Content Development

Interpersonal and intrapersonal communication deals with interaction and collaborative negotiation of codes/signs, backgrounds, texts, contacts, and contexts between participants (Jakobson, 1960), including these relations as private or inner-

speech for oneself. These affordances, including their ecological positions to each other, are perceived and interacted on by people to make meaning or semiosis. The modes of addressing semiosis are influenced and controlled by the social context they are found in. Both modes of communication are a part of the affordances, constraints, and contingencies available in the context of their production. In this second grade classroom, language sharing, including joint-attention and interpersonal/intrapersonal communication for content development, demonstrated a relationship between gesture and speech in communication and comprehension of content.

As mentioned in chapter three, Chandler (2009), using a Marxist perspective, explained that meaning-making is not found in relationship to other signs in a language system but in "the social context of its use" (p.9). Ultimately, it is the user of the language that determines the meaning from the available and shared eco-social affordances. Jakobson (1960) introduced context to understanding semiotics. However, he held on to structuralist views of language as being compartimentalized into codes and then proceeding to gain an understanding of language through the relationship between these codes. In contrast, in an SCT perspective there is no need to create dualisms by separating words as forms, from their content or what they mean. According to van Lier (2004) "Singling out the linguistic aspects of communication means the neglect of its embodied and spatio-temporal nature, and that means a disconnect between utterance, world and voice" (p.186). In an SCT perspective the word contains both substance/content and form. This interwoven combination provides the user with a holistic understanding and meaning-making ability of the affordances around them without the loss or imbalance of a word's form and function. In second language

learning, this holistic pattern allows for meaning-making that transcends linguistic coding translations that lose the materiality and pragmatic background of the word.

In answering research question one, the use of gesture for meaning-making for both teacher and students functioned through interpersonal and intrapersonal communication patterns that carried the content subject matter in the classroom. Dealing with less English language communication issues and more content-based challenges was Mrs. Dee's interaction with S3 concerning the hands and fingers math daily starter problem on the white board. In this situation, S3's palms and fingers are the focal point for solving the problem. S3 shares her hands, palm up, with Mrs. Dee as they discuss the problem at the student's desk. Evidence of a shift in attention focus and the role of the hands in the activity, occurs when they both leave the desk area and stand next to the board. S3's hands turned from palm up for both Mrs. Dee and S3 to view, to palms towards the problem on the board. Although, Mrs. Dee continued to ask questions, an analysis of her hand placement demonstrated that S3's focus was no longer on interpersonal communication but on solving for the problem. A quick switch from palm towards the board to palms facing Mrs. Dee and self occurs when Mrs. Dee asks S3 a question (line 29) that solicits a reflection on the answer "Ten" S3 just provided. At this point, S3 seems to reflect on the answer and turns her palms towards self and then replies:

29   S3: [I **think** there's ten fingers.]
          Turns palm back towards self while answering the question and then faces them
          back towards the chart.

Coupled with the earlier dialogue at her desk, S3 provided an embodied demonstration of where her focus and intention was directed. At the desk, S3 displayed palms up for

interpersonal communication but once at the board, she directed her attention and palms towards the problem itself. Of note, Mrs. Dee continued the pattern of palm-up when she lent S3 a hand (line 34) to solve for two problems that required an answer larger than 10. It would seem that Mrs. Dee provided an affordance with an interpersonal communication focus, as a result of her attention being on assisting S3 in making sense of the problem. In this demonstration, Mrs. Dee, knowing the answer, was not solving the problem and her gestures were focused on a more pedagogical, mimetic purpose for the student. S3 no longer needed a joint-attention focus between her and Mrs. Dee and demonstrated a focus on solving the problem rather than a preoccupation with communication. As a result, both participants used the human body as an artifact for teaching and learning.

The random sample scene also demonstrated gesture function for interpersonal and intrapersonal communication. From an interpersonal perspective, Mrs. Dee repeatedly displayed a physical form of indexing information and projecting the answer through her deictic gestures for the students. These gestures not only replaced demonstrative pronouns for pointing and shared directing purposes, but also developed a prompt for students to rely on in developing their answers. However, one student, S8 superseded the IRF pattern through a pantomime that demonstrated his meaning-making of the time-telling task in an intrapersonal way. His gesture pantomime carried the meaning of going to bed, which included information such as his perspective and point of view as a character in this pantomime, and artifacts such as a pillow and a bed. The student was not called on to answer, nor was he allowed to speak given the parameters of the IRF activity; yet, he performed this activity as a message and it was only through the teacher

acknowledging her intention to use his gesture's meaning that an interpersonal speech act occurred. This answer not only went beyond the expected one or two predetermined vocabulary word pattern in that IRF, it provided a connection of the task to his personal experience. Through the non-verbal channel, Mrs. Dee was able to gain certain insight into the student's identity and relationship with eight o'clock.

The going to bed gesture instead of "eight o'clock" answer by S8 provided a window for understanding the student's identity and voice. Although S8's performance may not have been directly aimed towards any one person in the classroom, the affordance of space and performance allowed for and demonstrated an answer that included his background history, identity, and voice. His answer was directly related to his personal experience with the time. This meaningful answer transcended the situation, which was based on a task eliciting arbitrary and non-personalized answers through the use of a pre-assigned vocabulary word. An answer or space in an activity that allows for a student's voice, produces the possibility for a dialogic experience between the teacher and student. This form of language learning is essential to a student's ability to self-regulate in the new language and culture. According to Vygotsky (1997d; 1986) and Leont'ev (1981), higher psychological processes and making-meaning of the human and hence, cultural experience is first acquired through interaction with others before being carried out independently by the individual. In this case, the second grade students learn and create his or her language and voice through their sense-making of the teacher's response and messages. Students continually work with a teacher-as-adult figure, and learn that their responses are only substantiated according to the meaning of the adult language (Halliday, 1975). As a result of S8's physical pantomime of his meaning-making of the

question, Mrs. Dee was able to acknowledge its usefulness, resulting in potentially new learning paths. One implication stemming from this data is that language teaching may be better served as a practice in providing communication found in real-world meanings to the students. This implication will pursued further in chapter seven.

Another major contribution gained from S8's pantomime, is the implication that formalized language-learning practices may only provide students with a literal and static relation to the information rather than a meaningful, identity filled ownership of the language. Identity voiced ownership of language allows for reallocation, imagination, and exploration of language in its dynamic use in multiple settings and spaces (Wenger, 1998). Meaning-making is located in the dynamic relation of living in the world. It is a participation process that takes in historicity and the new situation in the world. In meaning-making, human engagement in dialogue, social relations, perception, or any number of interactions convey a relationship of participation with available affordances in the ecological environment. "Participation is a source of identity" and "participants help shape each other's experiences of meaning" (p.56). Vygotsky (1997d) shared an eco-social perspective in viewing identity, meaning, and social participation, "Thus we might say that through others we become ourselves" (p. 105). His explanation of this statement is not limited to interpersonal interaction but refers to the history and development of separate functions through interaction with culturally created artifacts such as language.

In addition, S8's pantomime gesture of going to bed at eight o'clock, demonstrated a bi-directional approach that can take place in second language learning. In this case, it is not the advanced English-speaking teacher, Mrs. Dee, that must model the language to

the non-native speaking student as comprehensible input or input-output based SLA models would suggest. Instead, it is the learner that introduces the meaning to the content providing the possibility for further dialogue and learning to occur.

Contrarily, practices that require only one correct answer unattached to the students' world, does not allow for voice or identity to enter into the language development process. If answers are predetermined and responses from the teacher are limited in scope, the student is limited in the way adults make meaning of a term and the multiple affordances it can produce. In the random sample scene, the bedtime pantomime provided an affordance that transcended the IRF pattern for telling time and allowed for the opportunity of further engagement with the language. It allowed for a new trajectory in the path of learning that included an empowering form of ownership of meaning that was not available in the institutionalized curriculum practice for telling time. In this case, gesture was the only acceptable channel for S8 to demonstrate his meaning-making of the question.

In addressing the question of how gesture was used as a meditational tool for learning a second language, gesture used mimetically, afforded the teacher and students a physical and psychological tool, as a conceptually shared foundation or stage for meaning-making between both parties. Dialogue components between the participants that seemed to supported meaning-making included, joint-attention, intersubjectivity, cohesion of content, and changes or shifts in the communication patterns. Unlike discourse patterns found between teachers and students from a shared cultural background, interaction between speakers of different languages lack the transparency and shared pragmatic notions of homogenous native-to-native discourse. This ELL classroom contained

multiple cultures and languages. Gesture as a mimetic tool, was constructed between participants as embodied and recognizable shared signs. Similar to findings by Gullberg (1998), challenges in communication between the teacher and students were repeatedly surmounted by their references to concrete and foundationally shared knowledge through mimesis. Mrs. Dee's use of an embodied approach to content such as math problems and vocabulary allowed students a modality to internalize the information.

Mimesis afforded the second language learner a physical and psychological mediational tool to internalize the language. As McCafferty (2002) found, challenges in the verbal channel were successfully navigated by the NNS through nonverbal modes. Chapter five contained similarities, where mimetically used gestures were often at the forefront of the discourse to locate, retrieve, and define lexical items and were used as a means to internalize them for later use. In Example 29-31, the lexical term, *shaking,* as in shaking hands*,* the student and teacher demonstrated gesture's interpersonal and intrapersonal function in learning and using a vocabulary word. When S15 lacked the lexical item to describe a dog's action, he turned to an embodied non-verbal answer presented between himself and the teacher. This action invited the teacher to share in his experience; she replied by taking up his hand and verbally filling in the missing word by saying *shaking*. Although S15 immediately repeats it, we do not have a sound idea of his ability to use the word. A few minutes later, when he returns for a different comprehension check of his reading, he was able to perform the gesture again, and then come up with the appropriate lexical term. In this situation, the gesture was a meditational tool with an intrapersonal function. The gesture display provided an affordance to assist S15 in the production of the new vocabulary word. In the second use,

there was no response from the teacher to take up his hand again or a delay by the student to wait for her response. His gesture use was for intrapersonal functions which assisted him in recalling and using the sought after lexical item. According to McNeill (1992), gestures may make reference to an image or idea that provides the context for the verbal speech. Throughout the study, gestures used mimetically, not only filled in voids in teacher-student discourse but also gave shape and creation to the student's future ensuing verbal utterances. It is important to note that the "shaking" was available in illustration and text form to S15 in the first assessment with the teacher. However, it did not seem to be enough of an affordance to supply S15 with the needed communication to gain access to the needed lexical word. Instead, he turned to a gesture with an interpersonal communication intention to find the answer. As Mrs. Dee explained when watching her gestures on video concerning a different language challenge during a reading based on the Ferris wheel, "Kids are really concrete and so even showing them a picture is abstract. This [referring to gesture] is less abstract than an oral description or a written description of the Ferris wheel" (Interview 2, 1:54:12). It is possible that in this case, gesture, as an imagistic component of thought, took the lead in second language learning and provided a concrete foundation from which speech materialized.

The interpersonal *hand shaking* experience between Mrs. Dee and S15 support the hypothesis that "By performing the gesture, a core idea is brought into concrete existence and becomes part of the speaker's own existence at the moment" (McNeill, 2005, p. 99). This core idea or thought process was established through the use of image and speech together. According to Ilyenkov (1971) thought and meaning is a dialectical synthesis of speech and image. In this dialectic theory, meaning is made when speech and imagistic

components come together. Although we cannot see how thoughts and learning occur in the brain, manifestation of gestures, such as S15's, often embody thoughts and inner-speech, providing us a small window in the process of language development. Thought then "is subject to the laws of the external world" (Gal'perin, Arievitch, & van der Veer, 1995, pp. 118-119). The students' and teacher's speech and gestures are semiotically intertwined functions, both developed and influenced by the environment around them. In this way, gesture plays an important role in understanding a socio-ecological approach to learning that was demonstrated in S15's intrapersonal handshake dialogue.

Genesis and Transformation of Task and Activity

Chapter five data provided evidence of interpersonal participation and the meaning-making experience created through the implementation of gesture. A descriptive account of participation and the creation of a meaningful experience between Mrs. Dee and her students also demonstrated gesture's pervasive role in transforming practices that reduced language use to ones containing more meaning. Participation and meaning-making in this classroom was not just about translating or transforming language activities or tasks through an embodied experience. The study revealed the meaning-making processes provided through gesture created transformative possibilities in which the learning experience could take new shape in the classroom.

To answer research question one, the category of transformation of tasks and activities, was another theme that demonstrated gesture's role as a form of meaning-making for both the teacher and students. When gestures were implemented in the practice or task, the potential for new activities arose. Mrs. Dee repeatedly turned to

gesture as a pedagogical tool to assist the students in overcoming language challenges. In the hands and fingers math problems (Examples 15-17), math content was almost exclusively carried on Mrs. Dee's and S3's hands and fingers. To come up with the problem's answer and an additional one posed by Mrs. Dee, S3 turned to her own hands for the solution. S3 even borrowed Mrs. Dee's hand to produce an answer. At the end of the task, the student and teacher had moved from the desk and had produced a series of gestures to understand the math problem. Mrs. Dee even acknowledged the conscious effort they made in using gesture for problem-solving by iconically and metaphorically gesturing and stating that the answer may be produced when using your body to figure it out:

53 T: So [**when** you see charts like this]
Right hand index finger was pointing to "hands" in left column and then she extends all the fingers with palm towards the chart and moves it in a circular motion over the entire chart three times;
 [sometimes you can **use**]
Metaphoric gesture brings hands in front of self and Student with palm up, fingers extended and makes grasping/closing motions
 [your **own** self to figure it out].
Turns hands from grasping and closed to two open palm gestures with fingers extended; Circles her hands, up and down, around the torso of her body and then puts them out towards S3

The procedure used by S3 to answer the question in Example 15 was fundamentally different from the other students as a result of gesture use. When Mrs. Dee and S3 removed themselves from the desk and worksheet situation to a closer proximity to the problem a significant change occurred in the task experience. The transformation that took place near the white board allowed for an embodied experience for understanding and creating answers. As previously mentioned, S3 switched her gestural intentions as

well, from shared intentionality with Mrs. Dee at the desk to an intrapersonal focus on the problem itself. This transformation demonstrated a shift from S3's reliance on Mrs. Dee to her ability to take on the problem in a more self-regulated manner. This problem solving experience is a demonstration of Vygotsky's (1978) Zone of Proximal Development (ZPD). Through the use of Mrs. Dee's additional hand and the challenge of an additional question, S3 was able to demonstrate how she came up with her answer. Mrs. Dee was also able to see what assistance S3 needed in solving the problem. In the end, Mrs. Dee hoped that this process provided S3 with a meditational tool to solve future problems. She tried to reinforce the new experience referring to it as using "your own self to figure it out" while grasping and moving her hands in circular motions a few inches above her body (Example 20, line 53). This situation reinforces the concept of using the body as a readily available pedagogical artifact in the teaching of English and content in the classroom.

With regards to question two, gesture mediated the learning of English as a second language by providing Mrs. Dee and the students new embodied words that provided a space for both L1 and L2 background and identity to work together in their learning. Bahktin (1981) described this combination as dialogism. Using Bahktin's perspective, a person's voice is never their own but a combination of historic and present voices of an individual. For Bahktin, there is no "usual" or "normal" standard to language. Instead, language is about meaning-making found in the process of use, such as someone talking to someone else, including one's own inner-speech.

In the phonemic exercise (Example 40) a dialogic experience occurs as a result of gesture use, when students were provided space to bring personal narratives and

background histories to the activity. Mrs. Dee initiated an embodied strategy for the "blending" of two phonemes and then followed up with a question to determine if they understood the word. By checking for understanding, she allowed the students to share the meaning they attached to the word "crab". Two students shared personal narratives that included a metonymic representation of crab. S11 provided a walking crab and included a family based story in Cuba. S16 presented an iconic gesture representing claws and included a story based on a movie he watched. S15, who had the least experience in using English, struggled with making a connection concerning crab. Mrs. Dee's effort to provide S15 with a definition included the use of S16's gesture and a search for a Spanish-English dictionary. Eventually, Mrs. Dee reintroduces S15's gesture and S16 recognized "crab" and shared his own background on eating them. Mrs. Dee used S15's gesture to demonstrate joint-attention and interpersonal communication, but also produced it as a pedagogical tool for S16. The entire dialogue and practice placed meaning-making at the center, displacing a practice in segmenting and blending phonemic pieces.

In an SCT ecological perspective, language is viewed in a more meaning driven and holistic manner, where its connection to the social beings using the language is undivided (Lantolf & Thorne, 2006; Vygotsky, 1986; Wertsch, 1991). In this sense, the role of language is not about its demonstration of particular pieces but about the ability it has in producing communication, meaning, and higher order thinking skills in the world. Vygotsky (1997d) explained the relationship between meaning and the word. Concerning development in language functions, he stated:

the word must have meaning, that is, it must relate to a thing, there must be an

objective connection between the word and what it signifies. If there is not, further

development of the word is impossible. Further, the objective connection between the

word and the thing must be functionally used by adults as a means of socializing with

the child. Only then will the word have meaning for the child also (p. 105).

The relationship between the word and its meaning is especially important in learning a

second language. In this early elementary grade classroom, children demonstrated more

attentiveness, participation, and interaction with the words and content themselves rather

than a focus on form or accuracy in defining, pronouncing, and getting "it" correct

according to an outside source standard. The search for meaning led both Mrs. Dee and

the students towards narratives and a grounding perspective for understanding subject

content.

Transformation and Dissemination of Content

Gesture's role in the transformation of the activity and transformation of the

participant was also found to be limited according to the affordances the task provided. In

examples 44-50, a conceptual representation of superlatives was introduced to the

students through the gestural mode. This affordance allowed the students a physical

process to bring the superlative concepts to a new level of consciousness. Indeed, to take

on the question tasks at their desks, it was a student, S13, who instigated the gestural

motion to represent his answer and elicit assistance from the second teacher, Mrs. Mee.

The dissemination of the gesture to answer other questions on the worksheet, highlights

the new conscious awareness of the superlatives and their functions to solve the math

problems. When Mrs. Dee introduced the superlatives, conceptualizing *smallest*, *fewest*,

and *least* into one gesture, and *greatest, most,* into a related gesture, a new dialogue mode was achieved between her and the students. The transformation of these words into two gestures may have provided a new mode of understanding as a specialized register to meet the need of a particular math task. This new discourse was particular to a specific school task with little space afforded for the students' background attachment and meaning-making experience of their histories. In this case, the gesture use was able to assist communication between the students and their teachers in coming up with the correct answer. However, we do not know whether this type of dialogue was exclusively confined to the particular school related task or whether it might readily meet the demands of language beyond the activity. Mrs. Dee's gesture production transformed the practice and disseminated to the students and another teacher later that day and the next day, but datum is limited concerning its affect and meaning-making towards language use beyond the worksheet assignment.

In contrast, to Mrs. Dee's initiation of gesture for a conceptualization of superlative definitions, other examples demonstrate the students taking the lead in creating and presenting gestures as part of the meaning-making process of a word or concept. When this occurred, evidence of the students' background knowledge and context was provided and apparent for the teacher and me to view. Luria (1982) discusses how dialogue that is initiated or led by a child provides more social-communicative meaning in contrast to simplified referential meaning when the adult leads the child. Indeed, this distinction became visible when the students initiated or took-up the dialogue in their own words. This distinction can be seen in a comparison between the personal narratives that germinated from the phonemic awareness activity (example 40) and understanding

superlatives in a math activity (examples 41-50). In the phonemic awareness activity, students were able to initiate and control their actions, producing gestures for interpersonal communication with Mrs. Dee. The advantage of this situation was the ability of Mrs. Dee to imitate the students and hear their background context and meaning-making or sense-making of the words according to their perceptions. The students were also able to receive feedback according to Mrs. Dee's verbal and gestural response as to the correctness of the meaning they made. In contrast, the gestures introduced to conceptualize superlatives in math, provided little space for historic background or voice to emerge.

The differences in transformation use and dissemination of the gestures in using superlatives and learning vocabulary is an important point to recognize and one that is often neglected in language learning. The two practices demonstrated transformation, but the use of signs in the phonemic awareness examples led to new forms of communication where language created by the participants built a new context, semiotic frame, or meaning-making experience based on past events. This provided the students a new frame from which to interpret future events, activities, or words, demonstrating how language is alive and always in the state of becoming (Bakhtin, 1981). Thus both practices demonstrated a form of dialogism through the gesture modality; however, the practice and purpose of the task influenced whether the use of gesture provided a more restricted or liberated path of use. Kramsch (2000), explained these contingencies in her explanation of signs, "It is in the context of dialogic relationships that signs [such as gesture] get emitted, received, and exchanged; meanings proliferate and are constrained by custom and institutional control" (p. 152). In both of the examples, the teacher and

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students transformed the practice through the implementation of gesture imbuing the words with embodied meanings. The phonemic awareness examples demonstrated a more social-communicative purpose thus making the speaker's position, voice, and history, more visible and apparent. The use of gesture for understanding superlatives in math provided an explicit means to answering questions on a worksheet. By bringing gesture into the pedagogical practice the students and teacher provided unambiguous intention of what they meant. In the case of the phonemic awareness examples, the potential for meaning-making through the inclusion of past frameworks and histories, allowed for multiple paths of communication and learning to occur.

Summary of Analysis

In all, analysis of the data demonstrated the pervasive use of gesture to communicate joint attention, content coordination, and interpersonal and intrapersonal dialogue. Gesture was especially used as a means for starting tasks and introducing content to the students. Once joint attention was obtained further development of communication, such as conceptual words and narratives was often produced. Gesture functioned as a meditational tool for overcoming language challenges such as lexical searches and access to content. However, findings showed that the use of gesture to facilitate meaning-making of the subject tasks or for learning English was influenced by the affordances or constraints the activity allowed. Gesture associated with activities that required the same or only one answer was used to help obtain the answer and learn English but there was little room for dialogic voices and investment of identity that might lead to further languaging. In contrast, when gesture was displayed in association with activities that

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allowed for open-ended questions and dialogue - elaborate pantomimes and

transformation of the activity resulted. Further discussion including implications of the

findings and analysis through a SCT perspective and in association with pedagogical

practices for second language learning is provided in the next chapter.

CHAPTER 7

CONCLUSIONS AND IMPLICATIONS

Overview

One of the contributions this dissertation makes is the examination of the role gesture plays in meaning-making in an English second language teaching and learning situation in a second grade classroom. The examination of gesture in language between a teacher and her English learners allowed for a more in-depth understanding of how participants made meaning of the contexts and content found in their classroom. In particular, it was found that gesture plays an ubiquitous role in creating additional space and new meanings for teaching and learning a second language. A descriptive statistical account and the display of gesture in a variety of settings and content subjects, provided evidence for gesture's use to direct attention, build inter and intrapersonal communication, and transform practices through the rich meanings afforded through embodied learning.

This dissertation was based on a sociocultural theoretical (SCT) framework including an eco-social perspective in viewing teaching and learning. Using qualitative methodology - gesture, speech, and activity was observed and video recorded for almost one full term of the school year. Datum was collected *in-vivo*, allowing me first hand observation and the ability to review how gesture was used for meaning-making in teaching and learning a second language.

The two research questions central to this study are: (1) How does the use of gesture operate as a form of meaning-making for both teacher and students in a second grade sheltered English classroom? and (2) How does the use of gesture mediate learning of a second language? In avoiding language and meaning reductionism, the study was

grounded through the collection and analysis of gesture in an authentic classroom setting with candidates unaware of my focus on gesture and communication. A primary focus was placed on the teacher's use of gesture to teach English as a second language and content to her students. The students' use of gesture to learn the language was also analyzed as physical manifestations of the socio-ecological learning process. Both the teachers' and students' data are viewed as parts of the same ecological experience. In many instances, the gestures were not completely understood in the moment without having prior knowledge of previous gestures, statements, or activities, which in some cases occurred earlier in the day, or previous day, week, or even month before the actual display. To obtain some understanding of teacher–student dialogue and activity, one must have knowledge of their previous encounters and backgrounds. The post-classroom interview data provided some insights into the historical use and genesis for some gestures. The video recordings also demonstrate how some gestures were perpetuated from day to day. The data analyzed provided only a small sense of the participants' communication and meaning-making patterns but did allow for insights into the second language teaching and learning processes.

As previously mentioned, results of the data provided evidence of a variety of purposeful and spontaneous gestures used to overcome communication challenges, and to communicate both inter and intrapersonal content and material. Analysis of findings demonstrated that gesture use was pervasive in a variety of classroom subjects and was central in the creation of joint-attention, content coordination, embodying new vocabulary or other language challenges, building interpersonal and intrapersonal communication, and transforming practices to better facilitate the learning of English.

One finding of particular interest was gesture's ability to construct and disseminate new knowledge, thereby transforming the task into a more *meaning full* environment for learning. Transformation from traditional classroom practices into embodied learning allowed for more affordances and opportunities for the teacher and students to communicate and learn.

This chapter discusses the findings in relation to a sociocultural theoretical perspective, gesture research, and general educational practices. The rest of the chapter is divided into two major sections. The first section deals with a *discussion of findings*, including theoretical perspectives, and this study's position of gesture in comparison to mainstream pedagogical practices. The second section contains *implications,* which has been divided into subsections addressing gesture as image in thinking, the relationship of meaning-making and educational curriculums, limitations, and future extension of the research.

SCT, Gesture, & Meaning-Making

I will discuss the implications of gesture use for making meaning and learning a second language in a second grade classroom. While there may be numerous implications as a result of this study, I will discuss gesture as an affordance found in the eco-social environment of the classroom. The discussion and implication of the gesture data is based on a socio-cultural and ecological theory of language learning. Gesture was not viewed as providing a complete understanding of all meaning and language use in the classroom. In other words, language and meaning-making cannot be reduced to any one component of communication and channel for understanding the world. Instead, the

analysis and highlight of gesture was based on the focus of one important channel in understanding language. In this case, gesture is viewed as a part of the user as a whole person and stands in opposition to the view of a SLL as an "inputer" and "outputer" of grammar production units. A person's perception and meaning-making processes of the environment draws upon multiple systems and semiotic affordances around them. Gesture plays an important role as a material carrier for teaching, learning, and making-meaning in any subject or system and particularly in second language learning (McCafferty & Stam, 2008). In this analysis, gesture is not parsed from the verbal message including the syntactic and lexical constructions. In this way, the analysis avoids a form of reductionism of language where language can be stripped from its use in the world. In addition, an eco-social focus on gesture in meaning-making allows for the understanding that language is in essence both embodied and dialogical (McNeill, 2000; McCafferty, 2002; Wells, 1999). Although not all semiosis and thought processes are accompanied by non-verbal expressions, gestures often embody meaning-making including such aspects as thinking, inner-speech, intentionality, and instability in the teaching, learning, and using of a L2 (Faraco & Kida, 2008; Lazaraton, 2004; McCafferty, 1998, 2002). The following discussion and conclusion is focused on gesture's ability to provide the viewer a window into the processes of second language development.

A SCT Perspective of Findings

A fundamental concept in sociocultural theory is that the human mind is mediated. Vygotsky (1978) explained that humans do not act directly on the world but rely instead

on meditational tools and activities to change the world around them. In SCT, learning and development is a socially situated activity. Through interaction with culture, language, and any other artifacts, humans learn. Vygotsky (1978) explained that just as physical tools are created by people to control and change their physical environment, so symbolic and psychological artifacts, as auxiliary means, empower us to learn and develop. Gesture is an important mediational tool for communication, especially in interlanguage situations. One contribution of the findings was the creation of new meanings produced through the gesture modality. McNeill (1992) explained that gesture conveys different aspects of meaning that verbal speech cannot express without an elaborate amount of paraphrasing, if possible at all. This study supports his findings and includes the germination and transformation aspect resulting from the exchange of gesture in the second grade classroom. Through artifacts that function as *material carriers*, such as gestures, humans are able to promote and attach meaning to the semiotic signs around them. Analysis of the video recorded data indicated that gesture was an effective tool in carrying information and meaning to a task for both interpersonal and intrapersonal teaching and learning purposes.

Gesture as a Pedagogical Tool for Teaching Language

Mimetic gestures, for pedagogical purposes, became the crux for solving problems in a variety of contexts and subjects. Of particular interest were the changes in the practice, dialogue, or task that resulted from these gestures. Wells (1999) stated that change or transformation, "is the focal object of knowledge building; the goal is to improve or advance what is known" (p. 111). According to Lave and Wenger (1991) learning or change occurs in the participation of an ongoing cultural activity. By participating in the

classroom activities and dialogue, students constructed new meanings of words and concepts in their second language. The function of gesture in this transformation suggests that deictics for joint-attention purposes provided a mediational means to enter into the new dialogue or activity. Data demonstrated that the dialogue's course often moved in a pattern from simple identification of words and content through deictic gestures to elaborate pantomimes and mimesis in sharing connections and making meaning of a topic. This pattern follows Valenzeno, Alibali, & Klatzky's (2003) findings in an L1 classroom. Similar to Valenzeno et al., these findings suggest that gestures were used for their function to facilitate students' comprehension through creating and maintaining joint-attention, providing a second communicative channel or differing modality offering additional affordances of meaning-making, and its ability to provide concrete, physical examples from which a foundation was established where future language, speech and gesture, could germinate.

However, a subtle but major difference in this study compared to the mainstream gesture and children studies is the second language component of the situation. In this case, grounding speech through deictics or indexing gestures is an important aspect for the L2 to make meaning between the phonemes and the objects or representation they symbolize. Unlike these second grader's peers who spoke English for their L1, these L2 learners may not have had the verbal and cultural background experience when approaching many language practices required in standardized curriculums. In addition, many of the words carry connotations, concepts, or pragmatic features that are not pre-existing in a second language learner's first language. Beyond the possible differences in phonetic, syntactic, and lexical systems between an L1 and L2, meaning of the word can

be metaphorically and conceptually different for the second language learner. The situation in the second grade classroom can be viewed as a space where speakers of two different languages live and work. According to a weak version of the Sapir-Whorf hypothesis, language and culture shapes and influences perspectives, conceptual outlooks, and understanding of the world by people. This weak version is applicable to the participants of the observed classroom. As a result, the students' L1 background plays an important role in understanding new vocabulary and concepts in their L2. Gesture use, in conjunction with other signs, acted as a tool for communication and as a reconfiguration of one's historic past with the topic and with their own identity to that topic. Learning a new language is not just a relabeling of objects and activities found in this classroom or in the world. The young L2 learners displayed a variety of narrative perspectives through gesture in understanding the vocabulary words and tasks explicitly assigned by Mrs. Dee and designated according to pre-established curriculums. Mrs. Dee made a concerted effort to connect words and terms to their histories and to current examples. Gesture played a tremendous role in providing a foundation and meaning-making tool, which these examples and narratives relied on to convey meaning to the other participants.

An embodied display of language by Mrs. Dee and the students demonstrated a socializing, participating, and meaning-making practice with language. The embodied display of vocabulary words allowed for an additional channel for meaning-making. Indeed, embodiment of content is an important aspect to making meaning. In other words, "The semiotic activity of construing the world as meaningful 'content' must be cross-coupled to and matched up with the dynamics of the agent's bodily activity"

(Thibault, 2004, p. 61). This modality for learning provides a physical manifestation in the production and visualization of the content. As McNeill (2005) observed, its very production changes the perception, understanding, and language use between participants.

The act of allowing the students to create definitions and comprehension of the words allowed both the student and the word to be liberated in their ability to make or evoke meaning. When a variety of gestures were performed in a task, a variety of meaning-making experiences were evident. Similarities and differentiation between meanings provided a complex ecological environment where multiple affordances could possibly germinate. When students were provided space to gesture and speak, new possibilities were available for understanding words, content, and concepts. In examples 29-31 students demonstrated a use of gesture multiple times to access content. These findings suggest that students who performed a gesture as a meditational tool to learn new words in their L2, referred back to them to concretize new knowledge. Similar to Roth & Lawless (2002) and Roth & Welzel (2001) concerning gesture use and students learning new scientific lexicon and concepts in a secondary science classroom, this second grade-based study demonstrated the students' use of gesture for access to meaning. In this case, examples ranged from gesture use to overcome English lexical challenges to the understanding of new concepts or subject matter through an embodied modality. Results of this study displayed gesture activity as being performed well beyond the token use to transmit a new idea. Additionally, findings suggest that repeated gesture use assisted participants to make meaning of language and content leading towards self-regulation of the concept or activity.

However, a direct *cause-and-effect* approach to teaching a word or language, actually limits the semantic possibilities and flexibilities of their semiotic signs. One example of this can be found in the random sample scene, where gesture was part of a traditional IRF process with designated "correct" vocabulary answers. The pointing deictic gestures in the practice helped students obtain an ability to analyze semiotic tools such as the featured object, *clock*, and associated words, *o'clock*, *hour*, *minutes*, and some numbers. However, the one-to-one correlation between pointing with the finger to begin the initiation phase of the IRF and receiving the correct answer, restricted the affordances and multiple paths for learning available through the use of gesture or the object. The possibilities for meaning-making connections were low, in that a prescribed list of words were already known by the teacher and expected from the students.

Second language teaching approaches that rely on comprehensible-input based theories or models often demonstrate a cause-and-effect linearity in viewing language. Comprehensible-input and output based language learning models often view language and language learners in a static state where native speakers often establish the base-line for competent language use for the non-native speaker. Prescribed language models provide restrictive or limited meditational means or affordances to meet a learner's needs. A large body of SLA research (Ho, 2005; Mori, 2004; Shamoosi, 2004; Tsang, 2004; Wooldridge, 2001; Wu, 1993; Yano, Long, & Ross, 1994) conceptualized language interaction between NSs and NNSs with characteristics of a "here-and-now" orientation. They promote and privilege evidence of language between NSs and NNSs as containing characteristics such as being more predictable, containing narrower ranges of topics with abrupt topic shifts, repetitive, and full of comprehension checks, clarification requests,

question-and answer strings, and decomposition of words in comparison to NS to NS discourse. This hyper-correct view of language as being modeled by the native speaker, teacher, or language program may reduce the second language learner's possibilities or opportunities for meaning-making. Gestures that created joint-attention or basically a tool that provided associative meaning for the students, provided a concrete and *simplified* means for understanding some particular vocabulary and task processes as promoted by mainstream SLA studies. However, if this reductive view of language is extended to understanding dialogue, the ability for transformation and diffusion of the gesture is limited. It would seem that adding gesture and simplifying speech is *not* the keystone to learning a second language. Although a reduction in the syntax and lexicon of the language demonstrates a simpler point from which native speakers and non-native speakers may share intentionality or meaning; practices that limit the semiotic sign's dynamic ability to expand meaning may actually restrict the abilities and opportunities for the students to use them. Viewing second language learning as pieces that can be organized into a proper sequence, comprehensible, and then administered correctly, such as native speaker input-output approaches, focuses on language components for their *effect* on the cause of meaning-making in second language learning. Instead, practices that allowed the students to gain more control of their learning paths, were rich in meaning-making through gesture and speech modalities. Analysis of gesture demonstrated possible *reasons* for the meaning-making that took place according to the students' consciousness of a variety of signs found in their ecology. In addition, gesture as a possible affordance and reason for meaning-making provided the teacher a physical assessment of the students' perceptions and understanding of the language. As a result,

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Mrs. Dee was able to adjust the practice according to the students' gestures, which transformed the traditional practice into one within the students' zone of proximal development. The adjustments Mrs. Dee made in the activities suggest the focus on assistance Vygotsky (1987) described as needed for meaning to take place in thought, including the transformation of the person and their world.

In review, this study reveals how the teacher and students created new teaching and learning paths through the production of gesture and speech. It shows how gesture assisted in overcoming both language and content challenges, transforming tasks, and its germination to establish a foundation for meaning-making both interpersonally and intrapersonally. According to Moll (1990) the focus of change within the ZPD should be on creation and communication of meaning rather than just a transfer of skills from the more capable participant to the less capable partner. The production of gesture in this classroom demonstrated and created an array of meaning-making experiences, providing the teacher and students opportunities not afforded through the verbal modality. Gesture was used pedagogically, as mimesis, to concretize language and provide students an ability to internalize the content and make meaning of it according to their historic backgrounds. Gesture use demonstrated semiotic affordances not available through speech alone and not available because of differences in meaning between the students' L1 and L2 learning paths. The gestural affordances not only reinforced meaning in speech, they carried additional information, including the materiality of the word from their L1 background to support their L2 development. Gesture use by Mrs. Dee and the students allowed the L2 learners an opportunity and ability to mediate themselves by tools constructed in the moment, both spontaneously and purposefully, which brought

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concretization of meaning in the L2. Again, merely being in the room and participating in traditional school activities did not necessarily provide the students with appropriate access to their new community and language. Gesture was one affordance that allowed both the teacher and students to invest and demonstrate agency in appropriating concepts and meanings in the L2.

Implications

Gesture as Image in Thinking

The transformation of some activities through the use of gesture allowed for meaning-making and a new possible line of development not afforded through pictures or the verbal channel. Evidence of the unique affordances that only gesture provided in creating meaning challenges McNeill's (1992, 2005) growth-point hypothesis. According to McNeill, as mentioned in Chapter 3, a dialectic of speech and image combine to create thought in communication. In this study, examples of gesture in communication and meaning-making of intention by participants in the classroom supports the possibility that the genesis and creation of thought and meaning in L2 settings may be heavily imbalanced towards image. Perhaps, when speech is not readily available, image takes a full precedence in the thought genesis process. This would follow a parallel to the learning paths of deaf and hearing impaired concerning those children who are deaf from birth to hearing parents. In a situation where hearing parents are not closely communicating with their deaf child, an "impoverished" situation (Goldin-Meadow, 2003b) or possibly a L0 condition exists; albeit, always in motion as caretakers and child begin to develop imagistic communicative intentions or actual "home-signs".

Concerning the use of image in thinking, Grandin (1995/2006) provides a continuum model in viewing different ways of thinking based on a variety of Aspergers, Autistic, and mainstream functioning people. According to Grandin, some people, both disabled and mainstream, do not rely on words but on images or pictures to form meaning. Conversely, some use very little imagery, relying on pre-constructed symbols of facts associated with the word. "Some other people think in vividly detailed pictures, but most think in a combination of words and vague, generalized pictures" (p.11). In this classroom, students and the teacher seemed to rely heavily on gesture, as image, as a solution to gain meaning of the new vocabulary words, dialogue or challenging content problem. Indeed, Mrs. Dee shared strong opinions about gesture and its use for making-meaning, stating, "I don't really understand what you say, tell me another way, show me another way, because my goal is, usually, to understand what it is that you're trying to say" (Interview 2, 31:15). Comments such as this demonstrated that her gesture dialogue was not just about her production of them but also about what gesture the students produced. My observation and data recordings confirmed Mrs. Dee's focus in using gesture as an important way of watching the students and creating a space for all of them to communicate and learn new language and content in their second language. In some cases, gesture took the lead in communication and content development to such an extent that speech was even omitted in the activity.

Relationship of Meaning-Making and Educational Curriculums

As teachers face linguistically heterogeneous classes of students, a focus on language use and its accompanying ecology may provide us new ways of thinking about and approaching education. Minority language, as a part of literacy issues, has a long and

turbulent history in the United States. Many models and programs, which were developed specifically for minority language speakers, failed to consider culture, identity, and the meaning-making process from diverse linguistic/literary backgrounds and countries. Indeed, principals, teachers, and parents are continually being sold on models that supposedly address minority needs; yet rely on prescriptive methodologies and pre-constructed language learning paths. These programs perpetuate a mainstream bias that minorities are "problematic" but can be "solved" through proper accommodations and modifications.

As classrooms become more cosmopolitan, that is, students representing diverse cultures and languages, teachers need to become more aware of the role language plays in the social identity of students and their meaning-making processes. According to Gloria Ladsen-Billings (2009) our current education system replaces student voices with prescriptive language curriculum that stresses "rigor" and "high scores". In essence, the processes for meaning-making are often diminished and devalued for both minority and majority students resulting in a curriculum that performs what she calls, "a violence on young minds" by dismissing their voice, identity, and volition.

The success of second language learners in identifying, refining, and developing their voice and understanding to the environment around them is best accomplished in a social atmosphere that fosters communication in a reflective and purposeful way. Many models designed specifically for ELLs, base their theories of teaching and learning on accommodation and modification strategies. Hence, certificates and curriculums for ESL teaching are usually based on "strategy training" techniques and not on understanding authentic language issues in educational settings and on the particular needs of students

from around the world. In this setting, gesture is relegated to the position of para-linguistics, such as a conversational cue, with an emphasis on understanding its role as another strategy to assist in second language learning.

The U.S. education system is strongly influenced by standardized curriculum and testing, developed, written, and promoted in an American-English language based conceptualized perspective. In this paradigm, individuals are viewed as static thinkers and answers are defined as already created entities that are to be taken-up and put-out by students and teachers. Groups such as English language learners, deaf and hearing-impaired, Native-Americans, and other language minorities are positioned in a deficit and pejorative model in comparison to the mainstream English language speaking system (August & Hakuta, 1997; Crawford, 2007; Cummins, 2005). U.S. classrooms, curriculums, and testing are based on majority American-English language patterns that are incongruent, to differing language patterns not a part of the majority language and culture. Although there are many models advertised as addressing these minority issues, most do not account for the dynamic and dialogic nature of language and culture, the effect an L1 has on thinking patterns, and the social justice issues associated with access to second language literacy needs (Willinsky, 1998). These fundamental areas are not addressed by the structuralism and superficial view of language found in programs such as HQSI, SIOP, Universal Design, CALLA, and the like. In these programs, language is looked at as an entity, which can be manipulated for communicative purposes and as an object that can be structured in a fashion to lead the devalued minority group towards the dominant majority language user's educational goals. Hence, these programs profess to meet minority needs, but focus on *assimilation*, through simple tricks-of-the-trade type of

accommodations and modifications - disregarding the individual and their authentic language issues. These structuralized systems do little to address socio-ecological issues such as the dialectic and dialogic nature of language and the issues of identity, private and inner-speech, empathy, linguistic rights, and social justice.

This research examined language communication and meaning-making beyond the strategies employed in inter-language classroom exchanges. Curriculums and models concerning second language learning should not express gesture as a paralinguistic component. Curriculums need to avoid the limited viewpoint of gesture as only a supplement to speech, and a strategy to achieve comprehensible communication. Evidence of gesture use as a strategic component for communication in the classroom is only a by-product of its larger role in the socialization and identity creation as the L2 learner enters a new language and cultural system.

Instead, in a SCT perspective, gesture is a full part of what it means to participate in the classroom ecology. Gesture as a meditational tool for meaning-making is a fundamental part of a person's ability to establish dialogic and reflective language learning practices. Gesture as an affordance provides a physical and psychological way to manifest self-investment in their language learning. Gesture is a fundamental means for entering a new culture and language; this process best occurs when humans are allowed volition and agency in their learning to mediate their interactions with each other and their surroundings.

This research contained multiple examples of a teacher allowing students freedom to explore ideas and develop gestures to assist them in language needs. It also provided examples where an embodiment of content demonstrated transformation but was limited

in its dynamic paths for assisting the learner according to the constraints of the activity. Findings demonstrated that students led in the creation of many definitions and meaning-making experiences of language and content through their initiation and interpersonal use of gesture, first as a joint-attention focus and then to develop and carry meaning. An SCT approach places the students' learning path as central to learning and development in their L2 since it is *their* meaning-making experience. Gesture as a meditational tool for carrying content and overcoming language challenges allows multiple modalities for thinking and communicating. Teachers that provide and encourage space for gesture, allow themselves another modality to join the student in their learning path without placing limitations or reductions on how to use the language. Pedagogy of this nature, views the language learner as someone who creates new signs through the imitation of signs provided by the eco-social affordances of their environment. Gesture, as one of many affordances, embodies the students' *languacultural* realities and provides a teacher physical insight and a shared path into students' learning and development in a second language.

Limitations and Suggestions for Additional Research

Several limitations of this study must be acknowledged. The study is limited to two general questions concerning the use of gesture in one second grade classroom. It is based on English language teaching and learning with generalizations about second language learning coming from only one setting. It is possible that Mrs. Dee's experience working with this particular population has heightened her decision and ability to use

gesture for SLLs. Her abilities to communicate with the L2 learners may not be as readily available or obtainable by other teachers.

Another limitation was access to student language since the cameras and microphones were usually oriented towards the teacher's gesture use. This orientation places the teacher at the center of the study and preferences her role as central to learning a second language. In this case, the teacher is more heavily viewed and heard through video than the children and their voices. Evidence of students using and learning their L2 beyond the interaction with the teacher was available but limited. Future studies might place a mini-wireless microphone on the students to record authentic and spontaneous uses of their L2 beyond interaction with their teacher and the prescribed institutionalized language practices found in most classrooms. A focus on student use of their L2 beyond formal practice patterns should allow researchers to see more evidence of transformation and diffusion of the language in the context of their lives.

For this study, second language learning, participation and opportunities to make-meaning and gain experience in the students' lives were limited to a classroom experience. Language does not start and stop with the ringing of the school bell. As a result, this classroom experience is a limited view of their second language learning process. Indeed, beyond the gesture analysis of this study, it was interesting to note that S13 returned from Cuba on the second day of filming. He had missed over 30 days of school and had used only Spanish with his family and in the country. Upon his return, Mrs. Dee tested for English reading comprehension on a currently popular standard language program referred to as DIBELS. His English proficiency score actually demonstrated an increase from his past scores. Although no formal evaluation of this

particular situation is taken up in this study, it was interesting to note that the path(s) of second language learning for children at this age may by very dynamic and non-linear in comparison to the observations and formal tests that evaluate them. A central focus on the student and their language experiences should provide us with more extensive understanding of gesture's role in meaning-making for second language learning.

Uniqueness Characteristics and Future Extension of this Research

The results from this descriptive qualitative study show that gesture was used for meaning-making between the teacher, her students, and their ecological environment in a variety of functions. Gesture use ranged from filling lexical gaps to maintaining classroom management. Although a vast majority of bilingual and TESOL texts typically dedicate a chapter to non-verbal communication and/or gesture itself, the greater part of the research cited describes a perspective of gesture based on its complimentary functions to speech. Gesture chapters in most traditional texts also extend their discussion to its function for compensatory means such as gesture's use as contextualization cues (Gumperz, 1982). As mentioned in chapter one, a variety of studies have viewed gesture as their central focus for learners (Adams, 1998; Antes, 1996; Grant & Hennings, 1977; Kellerman, 1992; Jungheim, 2006; Mohan & Helmer, 1988) but I am not familiar with any studies that demonstrate a primary focus concerning gesture's use within the actual daily context of an L2 elementary classroom. The importance of this study is the perspective of bringing a sociocultural theoretical perspective to understand the functions of gesture in an early elementary classroom. It provides a descriptive account of gesture's function, between the teacher, students, objects or activities, and their ecological setting

in-vivo. This study should provide a basic foundation in gesture's functions in second language learning at an elementary setting, from which larger and more specific studies may explore. Findings included gesture and its functions for joint-attention and compensatory roles to further communication and overcome language challenges. It also provided a descriptive account of how its implementation changed the course of the learning activities. These changes are unique examples of gesture's ability as a material carrier and meditational tool for meaning-making, to provide opportunities and possibilities for learning that were not available through any other channel or modality. Some evidence of how these opportunities were taken up by the students was revealed but its extension into how this led towards internalization and self-regulation was extremely limited. Before the study began, I expected to clearly observe a cultural line of development between the microgenesis of gesture, performed by the teacher or students, and its process in a student's ontogenesis. Transformation of content, activities, answers, and language learning created through the production of gesture was evident; however, observation of the germination and dissemination of gestures were limited according to the restricted time period of the study and an inability to fully access the students' language. Future studies could pursue the relationship between transformation of the activity and a more longitudinal perspective of its role towards self-regulation in second language learning. Evidence for the dynamic paths gesture affords in language learning, including its meaning-making role in the students' line of development, may be more visible over a lengthier longitudinal study. Also, it is possible that a study which focuses on one specific student's interaction with the teacher over an extended period of time will

provide illumination concerning the relationship between transformation of activities,

self-regulation, and the student's ontogenesis.

APPENDIX A

DATA THEMES AND CATAGORIES

Data Themes & Categories selected for this study - Specific examples used are in bold

Gesture Function Categories	Date & Time	Topic/Content	Activity/ Subject/Setting
Joint-Attention	(All the time)		
	4-14 1M.5 (5:00 – 6:45)	Two students reading book -	Stations: Reading w/ partner
	May 11 (9:05 – observation) (9:15)	Thermometer example – S7 & Mrs. Dee S3 w/ questions – need a ruler	Science/Writing
	5-20 (12:30-1:30 – observation)	**Paired Reading – Bugs (S15 & S2)**	**Stations: Reading w/ partner**
	4-13 1M.1	S2 & S4 – Writing together	Writing
	Bathroom Permission - Daily	Students stand by magnets of their names near door – slide their name under bathroom category	Bathroom / Leaving the classroom procedure
	May 7 (1:05 – obsrvation) Afternoon – 1M.1 - 4:30 -33 Day 3 1M.1 (0:12:45) **Apr. 15 (Day 4) 1M.6 (22:00)**	S3—using a graph; needed more fingers to connect the dots Students point to parts of math problem at board - Graphs / math Points on their book during a choral reading with small group – takes turns pointing to everyone's words **Calls on student; Points out student's words in the pictures correlation**	Graph math problem Math / Graphs Small group reading time **Floor Reading Time**
	May 7 (1M.1 5-7), 04:30 – 3	Students point to parts of math problem at board;	Math
	Day 11 (Apr. 27) S17 & S16 (Morning)	Using the analogue clock Partner reading	Math group work Stations – partner reading
	Apr. 22 (Day 8) (11:33-observation)	**S5 – I want you to point – to the vocabulary word**	**Lower level reading group**
	Apr. 14 (Day 2) 1M.8 10:06	Pointing at bold words in reading book	

Joint-Attention: Explicit Gesture explanation	Occurred weekly/often Day 2 Day 6 (1:05:33) Day 7 (10:00) Day 9 (40:39) (4:32)	Chant/Songs 1 Chant/Songs 2 Chant/Songs 3 Chant/Songs 4 Chant/Songs 5	Group Floor Time
	Day 27 (5-21),	Chant/Songs 6	
	Day 7 (4-21) – 1M.4 4-21 (10:00) (16:02)	Chant/Songs 7 (Backwards day)	
	4-13 – Weekly	Chant/Songs 7	
	4-23 (Day 9) 2M.1 (40:39)	Chant/Songs 8	Group floor time
	2M. 1 (1:05:33) Day 6	Chant/Songs 9	
Joint-Attention: Classroom Management			
	Occurred Daily – **1M.1 4-13 (42:13; 42:40)** 1M.1 4-13 (29:40) 2M. 2 4-21 (21:46); (28:50) Day 2 -Random Day 3 (8:51) Day 3 (2A.3 14:50) Day 25 - 1M.1 (24:43)	Take 5; Finger to lip; hand raised w/ palm facing children; If you're listening touch your… nose, shoulders, ears **If you're listening touch your…** Finger to lips, Hands to cheek If you're listening touch your… Hand wave, quiet down Touches student/Shocked look If you're listening touch your chin… Take Five (Daily)	Classroom
	4-15 (18:50)	Beats - hand up/down	Classroom
	4-27 (2:44 by observation)	S10 – telling no	Classroom
	Every day; 4-16 (1M.3) 15:55; 16:52; 17:30	**Lowers students' hands by stretching out her hand and pointing to them and lowering her hand – pushiadsfasdfng down w/ palm face down and brings hand down from mid-torso to lower torso; Means "put your hand down" some w/ and**	**Classroom**
	Every day; 4-16 (1M.3) 15:55; 16:52; 17:30	**Lowers students' hands by stretching out her hand and pointing to them and lowering her hand – pushiadsfasdfng down w/ palm face down and brings hand down from mid-**	**Classroom**

	(Day 16 1A.4 - 0:41:50 and 3A.3 - 0:43:08)	Students Clapping/Not listening	Group Instruction - math
Interpersonal / Intrapersonal communication for content development (Including personal narratives)			
	5-21 (MoV043)(25:26) (31:20) (MoV08F) (0:05-0:55)	S18 – helped her w/ problem – didn't know American Football S13 – hands under table Mrs. Dee – Explains computer	Reading Test
	4-13 (1A.6) (25:20)	S10 – Bubble	
	5-5	Hands & Fingers math problem – S3	
	Apr. 20 (Day 6) 1A.6	Mrs. Dee physically positions herself and goes into drama mode to draw picture correctly	Whole group instruction – science writing time
	1M.1 4-13, Apr. 13 (30:06); (43:00)	Counting people / Absences – S17	Floor time/Transition
	Apr. 21 1M.4 4-21 (20:30) – Winston Bath;	**Winston bath –**	**Writing practice**
	1A.11 4-14 – 5:05	"Beadhead" story	Floor time reading
	April 13 (1M.1 & 1M.2 & 3: 00:00:01):	**Daughter Katie – "brag" vocab about her**	**Spelling/language arts**
	4-13 (1M.2 & 3):	**Winston Bath – "drag" vocab.**	**Spelling/language arts**
	4-13 (Cam.1.M. 2&3 (0:02:40)	**Melissa – crab, cuba, grandma**	**Spelling/language arts**
	Day 4 ((1M.6, 4-15, 16:48; 17:24) (17:50)	**Reading "Chicks and Salsa" w/ own stories/Winston** Food and Winston story	**Group reading time**
	May 6	Mrs. Mac & Class: Share personal stories about Happy and Hurtful words	Group reading time
	Apr. 16 (Day 5)	Story time – students share personal narratives going w/ story	Group reading time
	(MoV084) (Day 21) 0:01:39	Story Time – If you give a pig a pancake	Group reading time
	1M.2 5-6 (00:01) (0:09:13)	Bug story – crooked wing Leaf Eaters – Ants (Vocab-"Jaw")	

Self-Disclosure (T & S)	May 7 3M.1 5-7; (0:33:55)	Husband didn't get apple – it went to the meal worm	Science/Writing
	Day 3 (4-14) (10:35 – observation)	You shouldn't drink coffee/I drink coffee	Transition time to group reading
	Apr. 13 – Afternoon (32:00)	Head hurt/ slept wrong	Floor time
Vocabulary Definitions (T)			
	Apr. 23 (Day 9) 2M.1	Vocab: Axel & Rotor - definitions	Small reading group
	Day27 (5-21) 3M.2	Vocab exercise	
	4-15 (1M.6) 22:35 (25:25)	Vocabulary: Aroma Vocabulary exercise:	Small reading group
	May 6	Vocabulary: Superlatives in math	Math
	Apr. 13 (Day 2) (10:27 – observation)	Vocabulary word: Slimy	Small reading group
		Vocab: Vast	**Small reading group**
	Day 7 1M.1 – 0:09:05	Vocab: View	Small reading group
	Day 10 1M.3 – 0:00:01	Vocab: Tack	Spelling w/Privacy Folders Small group
Ellipsis	(1M.6, 4-15 16:48)	Chicks and Salsa	Group Floor Time
Predicate	May 7	Planting "Seeding"	Classroom
Mediated Memory	Apr. 29	Before Field day	String around wrist
	5-6 1A.4 – 0:30:14	Human Bar Graph – touching heads for matching	
Non-verbal Classroom Practices/Codes	Day 10 2M.2 – 43:00	Holds up book – receives dots/stickers for next assignment - while Mrs. Dee works with spelling group	Stations / Spelling group

Days of the study reviewed*

Mar. 30 Day 1 - X
Spring break   (1 week)
M Apr. 13   Day 2 - X
T Apr. 14   Day 3 - X
W Apr. 15   Day 4 - X
Th Apr. 16   Day 5 - X
M Apr. 20   Day 6 - X
T Apr. 21   Day 7 - X
WApr. 22   Day 8 - X
Th Apr. 23   Day 9 - X
F Apr. 24   Day 10
M Apr. 27   Day 11 - X
T Apr. 28   Day 12
W Apr. 29   Day 13 - X
Th Apr. 30   Field trip to library – out of classroom
F May 1   No observation or video
M May 4   Day 14
T May 5   Day 15- X
W May 6   Day 16 - X
Th May 7   Day 17 - X
F May 8   Day 18 (Partial day - Field day- out of classroom most of day)
M May 11   Day 19 - X
T May 12   Day 20
W May 13   Day 21 -
Th May 14   Day 22
F May 15   Day 23
M May 18   Day 24
T May 19   Day 25
W May 20   Day 26 - X
Th May 21   Day 27 - X
F May 22   Day 28

Data was categorized using examples from 17 of the 28 days

*All days were observed and video recordings were reviewed; albeit, only a fraction of scenes and time were selected for this dissertation

APPENDIX B

TRANSCRIPTION DATA DESCRIPTION

A transcription code modified and based on McNeill (1992) Speech and Gesture

1. Speech is transcribed fully from the videotape in ordinary orthography

2. Gesture is typed in italics below the speech. Gesture codes include the following:

[ ]   gesture phrase (stroke in boldface)
/   silent pause (multiple slashes for longer pauses)
(***///***)   Stroke not associated with speech
^   Rise in voice intonation
( )   Additional information to providing context to the situation by the researcher

T1   The main teacher of this study, also referred to as Mrs. Dee
T2   The assisting adult that comes in the afternoon, also referred to as Mrs. Mee
S1-S-19 – Student names were assigned a code of S1 (Student one), S2 (Student two),
and so forth for every child participant in the classroom

Numbers were assigned to every speech turn performed by the participant. Although
transcriptions were done for entire scenes, some examples only demonstrate partial
dialogues. Hence, shifts or jumps in numbers provide the reader knowledge of a break in
the dialogue or context. "Skips" are noted in the transcriptions. It should also be noted
that extended speech is segmented by conventional commas and periods to best match the
pauses and meaning of the participant's speech. However, it should be noted that periods
and commas are not a part of speech and they are placed according to this researcher's
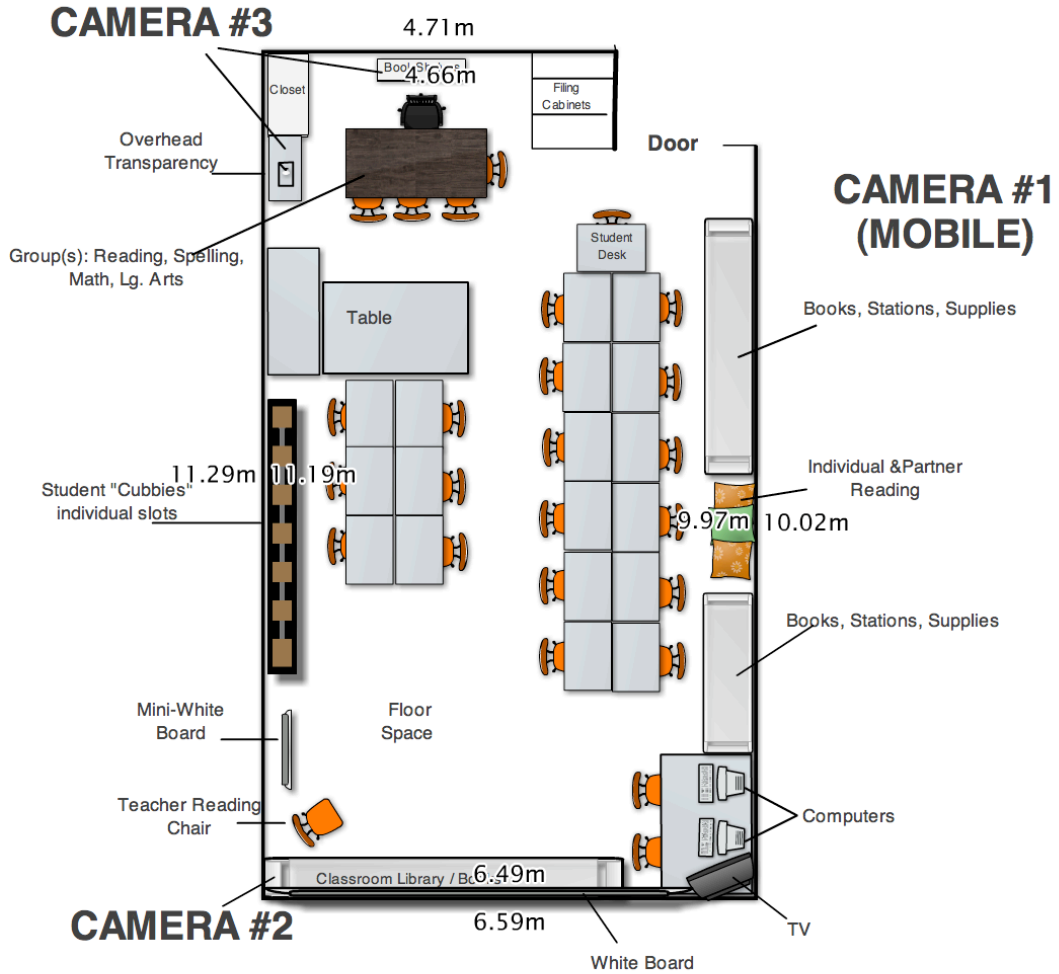understanding of the dialogue.

3. Gestures were analyzed according to the following points:

    1. Identification of the movements that are gestures (particularly the hands but also
       the arm, head, and body movements).
    2. Identification of the stroke phase, and in some cases the preparation or retraction
       phases. In the stroke, a concentration was placed on the trajectory, shape, and
       posture.
    3. Location the boundaries of the gesture phases in the relevant part of the
       phonological transcription.

4. Codings for gesture types include the following:

    1. Representational (i.e., represents attributes, actions, or relationships of objects or
       characters); two kinds:
          a. Iconic
          b. Metaphoric

2. Deictic (i.e., finger points or other indications of either concrete or imaginary objects or people)
3. Beats (i.e., formless hands that convey no information but move in rhythmic relationship to speech). This category can be confirmed by means of the beat filter below.
4. Emblems/Italianate: (i.e., deliberate and standardized movements that have a direct verbal equivalent known to others in the same speech community. Typically these movements continually demonstrate the same meaning when performed).

CLASSROOM DIAGRAM

MRS. DEE'S
SECOND GRADE CLASSROOM
&
CAMERA LOCATIONS

CAMERA #3

4.71m

Closet

Book Shelves

4.66m

Filing Cabinets

Door

CAMERA #1 (MOBILE)

Overhead Transparency

Books, Stations, Supplies

Group(s): Reading, Spelling, Math, Lg. Arts

Student Desk

Table

Individual &Partner Reading

11.29m 11.19m

Student "Cubbies" individual slots

9.97m 10.02m

Books, Stations, Supplies

Mini-White Board

Floor Space

Teacher Reading Chair

Computers

Classroom Library / Bc 6.49m

CAMERA #2

6.59m

TV

White Board

APPENDIX D

INTERVIEW QUESTIONNAIRE

General Questions (This section will be used only once in the initial interview)

(Identity/background-teaching questions)

1. How long have you been a teacher? An ESL teacher?

2. Approximately how many different languages have students brought to your classroom? Please list.

3. Do you try and incorporate the students' L1 in the classroom? How fluent or comfortable are you in using those languages?

4. What do you think about being an American-English speaking person teaching English to ELLs?

(Transition to teaching, communication, pedagogy practices)

5. How has your experience been working with English language learners?

6. What is your main teaching philosophy when working with ELLs? What do you want your students to gain from their classroom experience with you?

7. What are some of the main communication challenges that occur in the classroom?

8. How have you addressed these challenges?

9. What do you think about the communication process (between you and the students and between the students) in the classroom?

10. Have you ever thought about the role nonverbal behavior or gestures play in teaching and learning a second language? If yes, please share your experience.

Contingent Questions:

      11. Are you often conscious of your use of gestures in the classroom? If yes, can you give me some examples of gestures that you consciously use to help you explain/communicate something?

      12. Have you ever seen students mirroring your gestures, and why do you think they did that?

      13. Do you think your students' understanding is enhanced or hindered by your usage of gestures?

      14. Have you ever taken the time to explain gestures that are unique or highly meaningful in American culture to your students?

Video Clip Questions (to be used during clip viewing sessions):

      15. What is your reaction to watching yourself teach concerning communication?

      16. What did you notice about your nonverbal behavior in this video clip?

      17. What did you notice about the students' nonverbal behavior in the video clip?

      18. How would you describe the gestures that you are viewing?

      19. What meaning were you trying to share through the gestures you were using?

      20. How do you know when your gestures or nonverbal behavior is meaningful to the students?

Final Questions (to be used in the final interview):

      21. Does the observation of your and your students' gestures inform you in your understanding of the communication process in the classroom? How?

      22. Do you think that knowing about specific aspects of gesture helps you as a teacher? In communication?

23. Are there any changes in your teaching approach or philosophy that you will

make because of your analysis of gestures on video?

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