A Thesis

entitled

Changing Focus:
From Second / Foreign Language Teaching
to Communication Learning

by

Adina M. Postica

Submitted as partial fulfillment of the requirements for
The Master of Arts in English

____________________________
Advisor: Dr. Douglas W. Coleman

____________________________
Dr. Samir Abu-Absi

____________________________
Dr. Melinda Reichelt

____________________________
Graduate School

The University of Toledo

May 2006
An Abstract of

Changing Focus:
From Second / Foreign Language Teaching
to Communication Learning

by

Adina M. Postica

Submitted as partial fulfillment of the requirements for
The Master of Arts in English

The University of Toledo

May 2006

This thesis presents a historical overview of conceptions of language and language teaching and discusses the incompatibility of these conceptions with the reality of human communication. Emphasis is put on the work of Noam Chomsky and his followers, and assumptions on which they based their research are refuted. The thesis discusses the domain confusions on which traditional linguistics relies and reviews Victor H. Yngve’s framework for human linguistics. Based on human linguistics theory, a change in focus is suggested, from language teaching to communication learning; research in neurobiology
that supports the proposed change is presented. An experiment (previously reported at TESOL 2006) is described that looks at what constitutes input in real-world communication. The results of the experiment indicate the role of mental imagery in generating input for communication learning; the concept of mental imagery is discussed. New terminology is suggested as well as a number of ways to improve the outcomes of communication learning in classroom settings. Simulation in the classroom is reviewed from the perspective of human linguistics and retained as the most appropriate practical application for communication learning.
In later years it was thought, optimistically, that [defining language] was simply a problem of the blind men, each examining a different part of an elephant. It was thought that more work was needed on devising better test criteria and on how to interpret the results of the tests, and that these results would eventually converge on a consistent overall description of the elephant. But, as one of my students gasped when realizing the implication of the domain confusions, “There is no elephant!”

(Yngve 1996:46)
# Table of Contents

Abstract ii

Foreword iv

Table of Contents v

List of Figures vi

Chapter 1. Conceptions of Language 1

Chapter 2. Human Linguistics 13

  Domain confusions 13

  Human linguistics terminology 17

  Language 19

  Linguistic terminology 20

Chapter 3. Input Experiment 23

  Input in SLA 23

  Comprehensible input 24

  Input for communication learning 26

  Mental imagery 29

  Experiment 33

Chapter 4. Implications for Learning 44

  Classroom teaching 45

  Teacher training 49

References 51

Appendix 1: Study sheet for the experiment 55
List of Figures and Tables

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Theoretical constructs and corresponding physical objects</td>
<td>18</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Experiments and subject distribution</td>
<td>35</td>
</tr>
<tr>
<td>Figure 3</td>
<td>Instructions for the experimental group</td>
<td>36</td>
</tr>
<tr>
<td>Figure 4</td>
<td>Instructions for the control group</td>
<td>36</td>
</tr>
<tr>
<td>Figure 5</td>
<td>Text and sound sample in the training stage</td>
<td>37</td>
</tr>
<tr>
<td>Figure 6</td>
<td>Memory test quiz item</td>
<td>37</td>
</tr>
<tr>
<td>Figure 7</td>
<td>Text and sound sample in the training stage</td>
<td>38</td>
</tr>
<tr>
<td>Figure 8</td>
<td>Comprehension text quiz item</td>
<td>38</td>
</tr>
<tr>
<td>Figure 9</td>
<td>Self-report items</td>
<td>39</td>
</tr>
<tr>
<td>Figure 10</td>
<td>Statistical variables for self-report items in Figure 9</td>
<td>39</td>
</tr>
<tr>
<td>Figure 11</td>
<td>Additional self-report items</td>
<td>40</td>
</tr>
<tr>
<td>Figure 12</td>
<td>Correlations: Memory Test</td>
<td>40</td>
</tr>
<tr>
<td>Figure 13</td>
<td>Correlations: Comprehension Test</td>
<td>41</td>
</tr>
<tr>
<td>Figure 14</td>
<td>Possible predictors of accuracy</td>
<td>41</td>
</tr>
</tbody>
</table>
Chapter 1
Conceptions of Language

As indicated on the title page, this thesis is a partial fulfillment of the requirements for Master of Arts Degree in English; it should be added that the complete title of the degree includes with concentration in ESL. The acronym ESL stands for English as a Second Language, a field of study that focuses on the teaching of English (in all of its varieties) to non-native speakers of English around the globe. Other acronyms exist for closely related fields: TESL (Teaching English as a Second Language), TESOL (Teaching English to Speakers of Other Languages), EFL (English as a Foreign Language), etc. Some emphasize their preoccupation with the teaching of English, some simply consider English as it relates to non-native speakers.

The above paragraph is unequivocal for most readers. The notions of ‘English’, ‘language’, ‘first, second and foreign language’ seem clear and uncontestable to any layperson. This has not always been the case, however, in the field of linguistics. From early Sumerians to ancient Greeks to modern day neurolinguists, language has been regarded as an inherent part of the human existence that lends itself to study yet eludes an unequivocal definition.
Over the centuries, schools of scientific or philosophical thought have re-defined “language” to best fit the intellectual framework of their time. Language has thus been seen as something material, something behavioural, something mental, something biological, something abstract, something social or something cultural – to mention some of the stuffs language has been supposed to consist of. As for shapes, language is thrust down one’s throat as a thing, pushed as process, promoted as a procedure, auctioned as action, flogged as form, sold as system and marketed as means. Which bring us to diversity in design, conceptions of language being available in many a mode: nominalist, conceptualist, realist, obscurantist, eclecticist and so on. And each conception of language has its own finish …. As for origin: conceptions of language come with all kinds of credentials, tagged as Aristotelian, Platonic, Cartesian, Humboldtian, Saussurian, Bloomfieldian, Sapirean, Wittgensteinian, Chomskyan, and so on and so forth. (Botha 1992:xii)

In the 19th and 20th centuries, language has been, among other things, a skill, a habit, a behavior, a series of concepts underlying speech, a series of stimulus-response mechanisms (Kelly 1969:304-307).

A demarcation exists between Language and a language. Chomsky sees a language as “a set (finite or infinite) of sentences, each finite in length and constructed out of a finite sets of elements” (1957:13). Sociolinguists interpret a language as a social construct, a possession of a specific society (Mesthrie 2000:9). Most commonly a
language is referred to as “an open-ended cultural construct subject to multiple
dimensions of historical, geographical, social and individual variation, and liable (in
many societies) to political monitoring and control” (Joseph, Love and Taylor 2001:136).

Linguistics talks of concepts and conceptions of language, notions of language,
uses of language, rules of language (Kelly 1969; Chomsky 1986; Botha 1992).
Sociolinguistics discerns between language and dialect but oftentimes prefers the
politically correct term “variety” (Mesthrie 2001:9, 45). And there is also a
“commonsense notion of language” that apparently scientific approaches to language
simply choose to disregard (Chomsky 1986:15).

In the middle of this confusion, the question remains: what is language? And if
linguists cannot come to a consensus when defining language, is language even there to
be defined? Some might argue that in the light of all the linguistic research so far, the
answer bears no importance. It does, however, when it comes to practical implications
such as learning to communicate.

In the real world, humans communicate. Communication happens in numerous
ways, the most particular way being through what is commonly called the use of
language. Since Antiquity, it has been assumed that humans possess language ability – in
other words, that humans can exchange messages and convey meaning through language.
This ability is considered to be uniquely human and not even the evolutionary debate at
the end of the 19th century perturbed the assumption that language is an innate
characteristic of human beings. Nowadays, the term “language” applies to a wide variety
of perspectives and conceptions (Botha 1992:xii; Yngve 1996:10-11) not only in
linguistics but also in other fields of study concerned with the human ability to

The importance of developing communicative abilities beyond those useful in one’s native community has been recognized for millennia. In the ancient world, selected young students were dispatched to foreign cultures, to do their studies in loco, within the community that used the particular communicative abilities targeted; children of social status were entrusted to tutors, natives of another culture, who would help children acquire communicative behaviors particular of that culture (Danesi 2003:3). The Roman school system used an early form of “languages across the curriculum approach” where a child would be taught in school “at first by a Greek grammaticós (grammar teacher) and a Latin ludi magister (task/game master), and a little later by a Greek rhetor (teacher of rhetoric) and a Latin orator (teacher of oratory)” (ibid.).

The formal study of communication started in the Western world with “the Greek thinkers on language, and on the problems raised by linguistics investigations … and … was a continuing focus of interest … until the present day in an unbroken succession of scholarship” (Robins 1997:12). Long before the Greek philosophers though, the striving to encode the explanation of human communicative behaviors was fuelled by threats to survival. The imminent extinction, due to historical developments, of communicative behaviors pertinent of the ancient Sumerian civilization created the need to encode these in a form that would preserve them for future generations. Sumerian – Akkadian (Babylonian) grammatical texts were discovered, preserved on tablets written in
cuneiform script (Robins 1997:13). Modern grammar finds its roots in *grammatikós*, which until Plato and Aristotle “meant simply one who understood the use of letters, *grammata*, and could read and write, and *tēchnē grammatikē* was the skill of reading and writing” (op. cit.:17). The earliest text in Western linguistics is considered to be Plato’s dialogue *Cratylus* (Seuren 1998:5), which relates a debate about the origin of language. From one perspective, language is “inherently ‘true to life’, since words are given by nature, and not by convention” (op. cit.:6). From another perspective, “word forms are arbitrary and conventional” (op. cit.:7). The *Cratylus* debate continues into the 21st century and is nowhere near to reaching a consensus.

With the emergence of grammar in the Ancient world, it became possible to devise more and more diverse ways to encode the explanation of specific human communicative behaviors on a large scale. This helped natives of different cultures in their quest for learning how to communicate with each other and establish relationships unhindered by prior limitations in their communicative abilities. Thus, slowly, the study of language diversified and led to the emergence of what is known today as the fields of Second Language Acquisition and Second Language Teaching. For centuries, the formal teaching of second languages in the Western world was restricted mostly to the classical languages, Greek and Latin, and mostly to the ranks of clergy and aristocracy who could afford the luxury of education. With the advent of the printing technology though, information could reach a wider audience. Those most interested in communication beyond the limits of their native community were merchants, who quickly understood the advantages of being able to manifest culturally appropriate communicative behaviors: “even a smattering of your client’s mother tongue works wonders in business. It also
helps to safeguard against sharp practice” (Howatt 1984:6). The first textbook for the teaching of English to non-English natives was printed by William Caxton in Westminster in 1483, and was clearly meant to satisfy merchants’ communicative needs: “Who this booke shall wylle lerne may well enterprise or take on honed merchandises fro one land to another” (op. cit.:7). Lessons in textbooks for the teaching and learning of English as a foreign language throughout the centuries look very much alike. Howatt (1984) offers an abundance of examples of such lessons, from the very beginning of the printed word to the 20th century. They all bear a striking resemblance to lessons in present day textbooks; they include the alphabet, customary greetings, simple texts designed to introduce vocabulary for different purposes, dialogues, etc. Although the study of second languages has been a staple of Western education, the 19th century saw an unprecedented flourishing of approaches and methods for language teaching, which continued throughout the 20th century. This flourishing paralleled a flourishing in philosophy and sciences, and drew from research in those domains. The 20th century saw the blooming of attempts to apply scientific approaches to the study of language, and the emergence of methods based on these approaches (Kelly 1969; Howatt 1984; Brown 2001).

The abundance of methods for language teaching is indicative of the underlying problem that continues to haunt linguistic research in the 21st century: most of our present knowledge about human communication relies on two basic assumptions: language is an entity of the physical reality; humans use language in order to communicate. It follows that language can be studied like any other real-world object: it can be investigated as a whole; it can be broken down into its components; language components can be
analyzed, categorized and labeled; relationships can be determined between components, etc. Continuing, in practice if not in theory, to take Cratylus’s side in the millennia old argument by believing that language was “given by nature” (Seuren 1998:6) and the human species is the only species able to use it must have been a reassuring path in the tumult provoked by Darwin’s theory of evolution. The assumption that humans communicate by using language, an object that could be studied and mastered, and that language ability is uniquely human preserved a sense of stability at a time when Darwinism struck at the very foundations of Western thought.

Already in the 19th century, certain linguists recognized that the study of language was not enough to develop a true understanding of human communication. They argued that the physical aspects of communication could not be ignored and that linguists should cease to regard language as “an autonomous entity, or … an organism that lives and dies independently of the users of the language, and instead start to focus on the actions, as advocated by Whitney, and the mind of the language users, as stressed by Bréal, together with the situation in which they use it, as recommended by Wegener” (Nerlich 1990:xi). Although the assumption of language existing in the real world was never formally challenged, the problems inherent to working based on a false assumption grew deeper and deeper.

In the second half of the 20th century, a new series of assumptions was introduced that offered researchers a chance to continue discussing human communication from the perspective of the reality of language. In 1964, Chomsky proposed for the first time taking “as an objective for linguistic theory the precise specification of two kinds of abstract device, the first serving as a perceptual model and the second, as a model for
acquisition of language” (Chomsky 1964:26). He diagrammed the two devices as (a) and (b), respectively (ibid.).

(a) utterance $\rightarrow$ A $\rightarrow$ structural description
(b) primary linguistic data $\rightarrow$ B $\rightarrow$ generative grammar

and posited that both were part of an assumed “language organ” (Chomsky 1975:3-77). The second device was later referred to as the LAD (language acquisition device) and was supposed to receive data from language, which it then transformed into grammar, for the use of the individual in communication. The LAD became a central concept in subsequent second language acquisition research (e.g., Krashen 1985, 2003). In 1975, Chomsky introduced the concept of universal grammar (UG) as expressing “the essence of human language” (29), and re-defined the theory of language as “simply that part of human psychology that is concerned with one particular ‘mental organ’, human language” (op. cit.:36). He envisioned human communication as follows:

Stimulated by appropriate and continuing experience, the language faculty creates a grammar that generates sentences with formal and semantic properties. We say that a person knows the language generated by this grammar. Employing other related faculties of mind and the structures they produce, he can then proceed to use the language that he now knows.

(ibid.)

That every language has grammar has remained from the very beginning an undisputed assumption. Based on that assumption, Chomsky’s line of reasoning (1975) is a simple
one, as follows. Language has grammar. We are exposed to language. We begin to communicate without having learnt grammar. Therefore, it must be that we produce grammar from processing data from the language somewhere in our language organ. It is a logical explanation that accounted for earlier observations and theories and allowed for a spur of new linguistic theories in its aftermath, each theory having as a result the designing of yet another method for language teaching. The language organ provided a solid explanation of language under the assumption of its existence in the physical domain and in the absence of concrete evidence about the structure and functioning of the brain.

Contemporaneous with Chomsky’s research, “methods developed in cognitive psychology offered a way to begin to assess properties of internal representations” (Kosslyn 2006:5) and “advances in computer science offered new ways to conceptualize human information processing in general” (op. cit.:6). Much about the brain’s internal structure and functioning has been discovered in the decades after Chomsky proposed his theory of language. Scientists today know that the brain is nothing more than an object of the physical domain, an organ of the body consisting of billions of nerve cells … each cell communicates, on average, with 10,000 others, making up miles and miles of living wires. The nerve cells communicate with each other by means of a multitude of different chemical signals, of which only 40 or so have been identified, although their total number is likely to be far greater … [The brain] grows, repairs itself, and constantly adapts to the demands of the individual and the environment under the direction of an enormous array of brain specific
genes that scientists are just beginning to inventory and explore. (Bloom, 2001:2)

In recent years, a plethora of technological advancements has made it possible for neuroscientists to take a closer look at the role the brain plays in communication.

Techniques such as positron emission tomography (PET), magnetic resonance imaging (MRI), and functional magnetic resonance imaging (fMRI) allow us to view the structure of living brains and make reasonable inferences about the way they work. Tracer techniques have revealed some of the complex pathways of the brain. Computer systems that generate and analyze speech have shown that human vocal communication is a key element that makes it possible for us to transmit complex thoughts to each other at rates unattainable by other means. (Lieberman 1998:xv)

Research in neuroscience has produced evidence to support the premise that human communication is a direct result of brain activity and inasmuch is, like everything else pertinent to the physical existence of the human being, “ultimately explainable in terms of the basic structural components of the brain and their function” (Bloom 2001:3). In the final decade of the 20th century, Lieberman finally shifts the focus from language being a thing or “an instinct, based on genetically transmitted knowledge coded in a discrete cortical ‘language organ’” (2002:1) to language being “a learned skill, based on a functional language system (FLS) that is distributed over many parts of the human brain” (ibid.). He explains the FLS in the following way.

The FLS regulates the comprehension and production of spoken language, which alone exist in no other living species. Moreover, the FLS is overlaid
on sensorimotor systems that originally evolved to do other things and continue to do them now. Although the neural bases of language include the neocortex, some of the key structures of the FLS are subcortical basal ganglia – our reptilian brain. It too has evolved from its primeval reptilian form and, in concert with other structures of the brain, may be the key to human language and cognition. (ibid.)

In line with long held beliefs about human communication through language, Chomsky voiced his conviction that “the neural basis for language is pretty much of a mystery, but there can be little doubt that specific neural structures and even gross organization not found in other primates (e.g. lateralization) play a fundamental role” (1975:40-41). Contrary to Chomsky’s assumption, the neuroscientific research of the last decades of the 20th century maintains that “the neural bases of human language are intertwined with other aspects of cognition, motor control, and emotion” (Lieberman 2002:2). The existence and functioning of the FLS, well documented by Lieberman and supported by an impressive corpus of literature show beyond reasonable doubt the non-existence of both the language organ and the processing of the UG proposed by Chomsky (op. cit.:157-167).

Despite advances in the scientific study of the human organism in most of its aspects, neuroscientists continue to approach human communication in the millennia old fashion, positing still that humans exchange meaning through language (Bloom 2001:327-359). Research indicates a strong dependence between human communication and human biology which neuroscience still interprets as the processing of language, as if
it were a form of matter that exists in the universe, by the same structures involved in other aspects of human life.

The assumptions of language as an object in the physical world and of human communication as the result of our use of language were formally challenged shortly before the turn of the 21st century by Victor H. Yngve. After three millennia of debate, Yngve views human communication from a completely new perspective and demonstrates (1996) that language in fact has no physical existence and that this is precisely why it has been impossible to find a common ground in the never-ending disputes about language (1996:1-46). Linguistics without language may seem an impossible prospect. Yngve, however, lays the foundations for a new science of linguistics that studies human communication in the physical domain by taking into account the human organism as a whole when involved in real world communicative situations.
Chapter 2
Human Linguistics

Domain Confusions

In his quest to find out what language truly is, Yngve comes to the stunning conclusion that the term “language” nowadays applies to a multitude of items belonging to both the physical and the logical domain.

We find that language is seen as a natural phenomenon, the object of a science, a type of faculty, a kind of module, a type of object, a type of stuff, a type of system, as voluntary behavior, as something used, as something taught and learned, as having learned elements, as having patterns, as something spoken, heard, and learned, as something processed, as something organized and structured, as something produced and comprehended, and as data. (1996:10)

More views of language as found in the literature are enumerated on the subsequent pages. Yngve is not alone in his discovery of the multiple interpretations of language (e.g., Kelly 1969; Botha 1992; Mesthrie 2000). Nor is he alone in feeling dissatisfied with linguistics so far. As Yngve says (1996:11),
[w]ith numbing regularity new proposals march out onto the intellectual battlefield to wave colorful banners of X-linguistics or Y-grammar or the Z-model of language and vie for the allegiance of the rank and file. Perhaps the continuous march of new and inevitably unsatisfactory grammatical positions should lead us to suspect that there is something basically wrong with how the problem has been formulated.

Yngve starts out alone, however, in venturing to attempt to find the source of the problem and eliminate it once and for all.

Domain confusions, confusions between the physical and logical domains (op. cit.:24, 33), are what Yngve sees as the main problem in linguistics. It is because of these domain confusions that “there seems to be no scientific way of deciding among the many contenders or among the various ways they propose for analyzing linguistic materials” (op. cit.:11). In the real world, there exist humans who communicate; they can be studied scientifically as biology, medicine, and other sciences related to these have already proven. When communicating, humans engage in behaviors that, too, can be studied scientifically. Traditional linguistics though, holds the assumption that communication happens through “language”, a concept of the logical domain; the study of language has always “rested on traditional and arbitrary assumptions that had no necessary connection with the real world” (op. cit.:23). Over the centuries, researchers have strived to implement a scientific study of language (Coleman 2001:75-77). The blend of assumptions on which most of them base their approaches – language is the carrier of meaning, at the same time part of the physical world and concept in the mental domain; linguistic data “can consist of observation-tokens … or inferred generalized types” (op. cit.:
cit.:83) – have made them fail in their efforts. Nowadays, “logical-domain and mixed-domain theories are bankrupt as science” (Yngve 1996:77). Linguistics therefore needs to “move to the physical domain and pioneer a true science there. That is the only place where we can build proper theoretical models of people. That is the only place where we can formulate and test scientific hypotheses” (ibid.).

Leaving aside special assumptions and grounding his work in the scientific observation of communication and people engaged in communication, Yngve eliminates domain confusions and succeeds in creating a framework for the scientific study of human communication. The basic principle on which all science builds provides the foundation for Yngve’s framework: a clear separation between “(1) the real physical world out there, (2) our theories of the real world, and (3) our observations of the real world” (op. cit.:97). The physical world exists “in advance of our efforts to study and understand it” and is “independent of us as observing and theorizing scientists” (ibid.). The part of the real world that Yngve’s framework for the scientific study of human communication focuses on is the existing reality of “people interacting by means of sound waves, light waves and other physical means” (ibid.). Theories of the real world are “inventions of the scientist to represent our current best understanding of the parts or aspects of the real world we are officially curious about.” (op. cit.:98). We know, for example, that no brain structure functions as a language organ as Chomsky (1975) assumed; instead, when hearing ‘good morning’ articulated by her English teacher while seeing him for the very first time that day, in a Chinese learner’s brain electrical impulses called action potentials run through the axons of neurons (Bloom 2001:36) and trigger a behavior that communicates acknowledgment.
Chomsky’s assumptions of the language organ and the UG (1975) have been interpreted subsequently as an attempt to create the best understanding of the real world behaviors triggered by ‘good morning’ in the Chinese learner. Because these assumptions attempt to create an explanation solely in the logical domain, they remain, however, an attempt to explain events Chomsky created in the logical domain, not an interpretation of actual physical events. Chomsky’s assumption still stands because, as a construct of the logical domain, evidence can never be brought to validate or invalidate it. This is the case with the entire grammatical tradition, the nature of which dooms linguists to continual revisions (Yngve 1996:98) without ever reaching a consensus about a correct answer since each researcher begins from special assumptions of his own. On the other hand, theories in science are always tentative, but because their object of study is part of the physical reality, the scientist working in the physical domain will eventually come to a reliable conclusion supported by physical evidence; the ‘right answers’ in science do not depend on special subject-matter assumptions. Observations of the real world as well as experiments conducted in the real world are needed in order for the scientists to test their hypotheses. Testing is done “by calculating predictions … and then comparing the predictions with reality” (ibid.). Chomsky’s assumptions had no bases in the physical reality. His theory is not a model of the real world; it must therefore be dismissed in the further study of human communication.

In sum, Yngve gets rid of domain confusions and sets up to finally establish human linguistics as a science.
Human Linguistics Terminology

According to the conventions of science, Yngve devises a terminology to be used in human linguistics that clearly separates between objects of the physical domain and representations of these objects in the mental domain. In the same way the objects of science are known in terms of their properties, the conceptual representations of people in the mental domain are identified each in terms of their properties. It follows that in human linguistics

we will be speaking of the linguistic properties of a person [which are] theoretical constructs characterizing people from the point of view of how they communicate and answerable to observational evidence about how they communicate. (Yngve 1996:123)

When we talk about an instance of communication in the physical world, we talk about a group of at least two real people (group members) who at one given moment exhibit a particular communicative behavior by making use of their linguistically relevant surroundings (real world objects and energy flows) (op. cit.:84-86). Yngve identifies this as an assemblage (op. cit.:86). Communication in the physical domain involves persons in assemblages. Persons engaged in communicative behavior are conceptualized as communicating individuals. A communicating individual is “a representation in linguistic theory of a person that includes just those properties that are required to account for that person’s communicative behavior” (op. cit.:124). The assemblage is conceptualized as linkage. A linkage is “a representation in linguistic theory of an assemblage that includes just those properties that are required to account for the communicative behavior associated with the assemblage” (op.cit.:126) (see Figure 1).
<table>
<thead>
<tr>
<th>REAL PHYSICAL OBJECTS</th>
<th>THEORETICAL CONSTRUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person</td>
<td>Communicating individual</td>
</tr>
<tr>
<td>Assemblage</td>
<td>Linkage</td>
</tr>
<tr>
<td>Group member</td>
<td>Participant</td>
</tr>
<tr>
<td>Energy and means of energy flow</td>
<td>Channel</td>
</tr>
<tr>
<td>Physical object</td>
<td>Prop</td>
</tr>
<tr>
<td>Other parts of the surroundings</td>
<td>Setting</td>
</tr>
</tbody>
</table>

Figure 1. Theoretical constructs and corresponding physical objects (Yngve 1996:130).

The elements of the assemblage are conceptualized as *constituents* of a linkage and are also identified in terms of their own properties. A *participant* is “a representation in linguistic theory of a person that includes just those properties that are required to account for that person’s communicative behavior in a particular assemblage” (op. cit.:125). A *channel* is “a representation in linguistic theory of the physical mean of energy flow and the energy flow itself in an assemblage that includes just those properties that are required to account for the communicatively relevant energy flow in the assemblage” (op. cit.:128). A *prop* is “a representation in linguistic theory of a real object, instrument, or device in an assemblage that includes just those properties that are required to account for its communicative relevance in the assemblage” (op. cit.:129). A *setting* is “a representation in linguistic theory of other parts of the physical surroundings of a group in an assemblage that includes just those properties that are required to account for their communicative relevance in the assemblage” (ibid.). In the physical
domain, a person is in constant interaction with the objects of the real world. When engaged in a communicative act, a person responds to another’s communicative behaviors by exhibiting communicative behaviors of his own. These behaviors are represented in the mental domain in the theoretical constructs of inputs and outputs. They represent “the flow of energy associated with communicative behavior, that is, the sound energy of speech, the light energy associated with gestures, the pressure of handshakes, and so on” (op. cit.:132). At a first glance, a communicating individual in a linkage receives inputs and produces outputs; however, the same flow of energy can be, in a given linkage, input and output at the same time. It is output for the participant whose change in properties produces the energy flow, input for the participant whose properties are affected by it.

Language

Yngve (1996:1-46) establishes the non-existence of language as an object of the physical world, and discusses the domain confusions that have plagued linguistics over the centuries due to the wide range of assumptions about what language might be. In order to avoid further confusion, human linguistics chooses to eliminate altogether the use of the term “language” instead of redefining it, as generations upon generations of linguists have done, and sets out to study people’s observable communicative behaviors and communicative abilities in terms of linguistic properties. But how can a science of linguistics exist without language, which would seem to be the very object of study of such a science? Yngve proves that there never was such an object and that all the work so far has been done in the logical domain (op. cit.:45). People have been communicating all
along, but the field of linguistics, instead of studying their communication, has devised criteria for the analysis of nothing more than logical assumptions.

Each criterion characterized an *a priori* view of some characteristic of language or the objects of language, and since there was no reality, no object with existence prior to the tests, they did not describe any existing object and there was therefore no guarantee that they would even be consistent with one another. With no physical reality, no scientific tests are possible. (Yngve 1996:46)

There is no need to worry about the absence of “language” from human linguistics. In human linguistics, the physical elements of human communication are under scrutiny, and the study of changes in their properties will finally lead in the near future to a scientific understanding of human communication.

**Linguistic terminology**

The terms “acquisition” and “learning” have been used interchangeably in linguistics for a long while. Stephen Krashen (1985:vii) introduced the distinction between acquisition and learning in his “theory of second language acquisition”, the most important part of which is the Input Hypothesis. Krashen posits that “‘acquisition’ is a subconscious process identical in all important ways to the process children utilize in acquiring their first language”, while “‘learning’ is a conscious process that results in ‘knowing about’ language” (1985:1). Krashen is right in making a distinction between the two terms; he is wrong, however, in persisting to believe that language can be acquired.
Human linguistics has established that language is not part of the physical domain, but a series of abstract philosophical concepts which, much like mathematical concepts, are meant as an explanation of the observable communicative behaviors manifested by human beings. As such, language only exists in the human consciousness – what Yngve refers to as the “mental domain” – where we construct theories of the reality in order to “represent or model as closely as possible the reality” (1996:121). One can therefore not talk about language acquisition as an unconscious process any more than one can talk about calculus acquisition as an unconscious process. Language as a system of arbitrary rules and signs that explain communication, much like mathematics, can be only consciously learned, and language learning may be helpful for certain subjects in the development of their communicative abilities. Language learning can only be a conscious process.

Communication oftentimes takes place without conscious effort on the part of the communicating individual. What happens in this case in the learner engaged in communication is the acquisition of naturally occurring communicative behaviors. These behaviors can sometimes even be completely devoid of any speech behaviors. Interestingly enough, with the exception of audio-only recordings, speech behaviors never occur in the absence of other communicative behaviors (e.g. gestures, facial expression, etc.). Even on the telephone, for example, people exhibit gestures, changes in facial expression, etc. In sum, language cannot be acquired, yet communicative ability can.

As a direct consequence of the above, the fields of linguistic study that discuss language acquisition need to change their title and terminology to reflect the
understanding and acceptance of the premise on which human linguistics builds. First / second / foreign language acquisition and first / second / foreign language teaching and learning as well as acronyms like SLA, ESL, EFL, L1, L2, etc. are a nomenclature that needs to be replaced. A new terminology must be decided upon and implemented, one that would clearly avoid domain confusions and would distinguish between the realm of the physical reality and the mental speculation. For the purpose of this thesis, I will be talking about communication learning. I continue to refer to teachers and learners as such – a tradition that goes as far back as the dawn of time, past Socrates, the embodiment of the teacher in Western thought, and that scientific research validates. I will refer however to present day “ESL / SLA / language etc. specialists” as communication learning specialists.
If “language” does not exist, what is then the input that communicating individuals receive in order to be able to communicate? Can this type of input be scientifically analyzed so that rigorous methods for learning to communicate be developed? This chapter looks at input-related issues from a traditional, respectively human linguistics perspective before presenting an experiment that focuses on one aspect of real-world input.

**Input in SLA**

Input in SLA (second language acquisition) is the TL (target language, the language that is to be learned) that is available to learners. The target language “comes from a variety of sources including the language that the learner hears (e.g. in the classroom by the teacher, outside of the classroom by speakers of the second language), reads (in textbooks, in other reading materials), or sees, in the case of a signed language” (Gass 2000:31).
Comprehensible input

Comprehension and input are old concerns in the field of second language acquisition. It was Stephen Krashen who coined the term *comprehensible input* and situated it at the center of his theory of second language acquisition (1985:vii). Five hypotheses are part of this theory, the most important one being the Input Hypothesis. According to it,

we acquire language in an amazingly simple way – when we understand messages. We have tried everything else – learning grammar rules, memorizing vocabulary, using expensive machinery, forms of group therapy, etc. What has escaped us all these years, however, is the one essential ingredient: comprehensible input. (ibid.)

Recently, Krashen revised this hypothesis based on his conviction that comprehension is key for language acquisition, and that “mere input is not enough; it must be understood” (2003:4). The Input Hypothesis became thus the Input/Comprehension Hypothesis (op. cit.:4-5).

In his theoretical research, Krashen follows in Chomsky’s footsteps and views input as consisting primarily of language, “primary linguistic data” (Chomsky 1964:26). Language is acquired effortlessly and involuntarily (Krashen 2003:4) and processed by “what Chomsky has called the ‘language acquisition device’, the part of the brain responsible for language acquisition” (op. cit.:6) to be finally converted into grammar (Chomsky 1964:26). Yet Krashen differentiates himself from Chomsky by proposing that input is not solely language, but also “extra-linguistic context” (Krashen 1985:2). “Comprehending messages is the only way language is acquired”, Krashen insists
messages are seen as consisting of language and extra-linguistic information. In order for messages to be understood, Krashen points out that the input must be comprehensible – that is, beside language, messages must contain specific information that allows us to decode it “with the help of our previously acquired linguistic competence, as well as our extra-linguistic knowledge, which includes our knowledge of the world and our knowledge of the situation” (ibid.).

However, the assumption that input consists primarily of language has been shown to be false (e.g., Klein 1986, Yngve 1996, Coleman 2005). Wolfgang Klein (1986) describes a thought experiment, the Chinese Room, to show that “primary linguistic data” (Chomsky 1964:26) cannot be a component of comprehensible input: “Suppose you were locked in a room and were continually exposed to the sound of Chinese coming from a loudspeaker; however long the experiment continued, you would not end up speaking Chinese” (Klein 1986:44). This would seem to support Krashen’s comprehensible input theory – if it were not for Klein’s disbelief that language is actually part of input. Klein investigates further, proposing that “what makes learning possible is the information received in parallel to the linguistic input in the narrower sense (the sound waves)” (ibid.). If language were contained in the input, the Chinese Room would work; the learner would exit the room with knowledge of what was being communicated and would be able to apply that knowledge to real-life interactions. This is not the case though, and the Chinese Room does not work. Krashen is right about comprehensible input – about the extra-linguistic knowledge necessary for successful communication – yet he is wrong in his assumption that language exists and is an acquirable part of this input. “Krashen is wrong to the degree that he shares [the] false assumption that the
relevant input consists of ‘primary linguistic data’ and nothing more” (Coleman 2005:207).

Yngve shows that language, the way Krashen and many other linguists understand it, has no existence in the physical domain (1996:10-46). The idea that language could be part of input becomes thus illogical.

**Input for communication learning**

If language is not part of comprehensible input, explaining how learners in traditional classroom environments apparently lacking in comprehensible input acquire communicative ability might appear an insurmountable challenge. To understand how comprehension and input affect a person learning to communicate requires that we discuss them in the real-world terms of Yngve’s framework (1996). From a human linguistics perspective, the analysis of comprehension and input in the physical domain leads to the following conclusion: “Comprehension’ in a real-world sense is a physical change in state in one of the participants as a result of linkage events. Its causes can include information in any of several channels in the linkage” (Coleman 2005:208). Input is “the full range of sensory experience available to the learner at a given time” (op. cit.:207). Thus, in human linguistics, input is the full range of sensory experience available to the learners that triggers a change in their internal physical state.

Krashen’s “comprehensible input” involves language. In order to avoid further domain confusions, we will be referring to the full range of sensory experience available to the learner that triggers a change in their physical state (Coleman 2005:207) as *input for communication learning*. The input for communication learning that an individual
receives can reach the participant in a linkage through a variety of channels and can trigger a variety of outputs, observable in the physical domain in a variety of behaviors. Take Yngve’s *Go!* example (1996:3-4). In one scenario, a girl’s articulation [gow] leads to a boy starting running; in another, it leads to a boy picking up a game from a shelf. In each case, the input [gow] determines different changes in the internal properties of the communicating individual that receives it (the boy). The changes occur due to the specific properties of the linkage in which the communicating individual is engaged at the time he receives the input. Although the channel is the same (the sound waves), the setting and the props the communicating individual is interacting with at the time of input determine other specific changes in his internal properties that are manifested externally through different behaviors. In yet another scenario, the same boy who turns to the shelf to pick up a game in Yngve’s example might simply turn to his sister and say: “What? Go where?” He would then excuse himself by saying something like, “Sorry, my thoughts were somewhere else”. Here the output produced by one communicative individual (the sister) is considered by her as valid and sufficient (given the properties of the constituents in the particular linkage she and her brother are engaged in) to determine the desired changes in the internal properties of the other communicative individual (the boy). When this output reaches the boy as input, it fails to trigger the expected change in the boy’s internal properties; thus the boy does not manifest the expected behavior of picking up the game. This would seem to indicate that more is at play when communicating than just processing external input.

Practice shows that learners in traditional classroom environments lacking in comprehensible input the way Krashen defines it are able to acquire communicative
ability, albeit to greatly varying degrees. According to Krashen’s Input/Comprehension Hypothesis, this should not be possible; and yet, generations of teachers stand witness to their learners’ inexplicable success. We defined above input for learning to communicate as the full range of sensory experience available to the learner that triggers a change in their physical state. Neuroscientific research has shown that changes in the internal properties of a human organism that lead to the onset of communicative behaviors occur in the brain (Bloom 2001:316-358). Some learners manifest the same internal changes and their related behaviors in the absence of external input. This observation allows us to hypothesize that in the absence of external input, the brain is able to trigger changes within itself, and these changes substitute for that type of input. In support of this hypothesis comes the idea that the environment is a source of “perturbations and not of instructions” for the living being (Maturana and Varela 1992:96). In other words, “the perturbations of the environment do not determine what happens to the living being; rather, it is the structure of the living being that determines what change occurs in it” (op. cit.:95-96). This indicates that not only external influences, from the outside environment, can trigger internal changes in the living being (from the particular perspective of communication, the communicating individual); its internal organization may allow for changes from within to satisfy the demands of its structure and functioning.

The process that allows neural circuits to work as usual in the absence of electrical impulses received from the motor-sensory receptors, thus allowing humans to recreate scenes, sounds or smells in their brain is called mental imagery (Bloom
2001:344) and has been studied intensively since the 1950’s both in cognitive psychology and later in neuroscience.

**Mental imagery**

Since human communication has been, for millennia, supposed to happen through the use of language, the brain has been most often perceived as possibly containing the organ that processes language (Chomsky 1975). As early as the second century A.D., dissectors of animal brains had discovered that the brain was the center of the system of nerves that conferred the human body sensory and motor abilities (Bloom 2001:9). In the subsequent centuries, much was learnt about the anatomy of the brain, and some about the role the brain plays in coordinating an individual’s existence, yet research on the organization and functioning of the brain has never recorded such progress as in the second half of the 20th century, and into the 21st. The study of the brain nowadays interests scientists from a wide range of disciplines and neuroscience is the modern field of research on the brain. The general purpose of neuroscience is “to link the biological and chemical properties of the brain and its component cells to behavior” (Bloom 2001:10), and the fundamental premise on which it builds reads as follows (op. cit.:3).

All the normal functions of the healthy brain and the disorders of the diseased brain, no matter how complex, are ultimately explainable in terms of the basic structural components of the brain and their function. Any change in the properties of a human organism, external or internal, within or beyond our conscious awareness, is the result of brain activity; in other words, any such change is the result of events taking place in specific, definable locations within the brain. Given
the complexity of the brain organ, and the still extremely limited knowledge researchers have of the processes of its internal functioning, it is understandable that not all the events have been explained yet in terms of the particular parts of the brain involved and their precise roles in creating these events (Bloom 2001:3-4). Modern researchers, however, are able to theorize, in the scientific tradition of the past two centuries, about brain activity based on concrete observations and extrapolate from already existent models of neurological activity that rely on evidence processed from data obtained with some of the most advanced technology of our times.

Techniques such as positron emission tomography (PET), magnetic resonance imaging (MRI), and functional magnetic resonance imaging (fMRI) allow us to view the structure of living brains and make reasonable inferences about the way they work. Tracer techniques have revealed some of the complex pathways of the brain. Computer systems that generate and analyze speech have shown that human vocal communication is a key element that makes it possible for us to transmit complex thoughts to each other at rates unattainable by other means. (Lieberman 1998:xv)

As a direct consequence of its object of study, neuroscience is concerned with the study of human communication. Given the neuroimaging data collection instruments, the study of human communication has already begun its transformation from a series of theoretical assumptions into a corpus of hard science data that can be analyzed and processed, and that will provide explanations of human communicative behaviors that withstand the test of the physical domain.
Mental imagery is a result of brain activity that remained until fairly recently a puzzle for researchers. Little was known about mental imagery until the 1970’s, although imagery events had been observed and recorded and speculated on for millennia. “Mental images were at the heart of early theories of mental activity, dating at least as far back as the classic Greek philosophers and figuring predominantly in both philosophy (until the 19th century) and early scientific psychology” (Kosslyn 2006:4). The reality of the phenomenon of mental imagery was first suggested based on observations of subjects self-reporting the internal events that led to their accomplishing a task in the absence of an actual external stimulus.

Over time, imagery has been seen as playing an important role in memory, problem solving, creativity, emotion, and communication (ibid.). “Imagery is a basic form of cognition and plays a central role in many human activities – ranging from navigation to memory to creative problem solving … It is likely to be one of the first higher cognitive functions that will be firmly rooted in the brain” (Kosslyn 1983:1). A mental image is defined as the neurological event that occurs when a representation of the type created during the initial phases of perception is present but the stimulus is not actually being perceived; such representations preserve the perceptible properties of the stimulus and ultimately give rise to the subjective experience of perception. (Kosslyn 2006:4)

Neuroimaging techniques have allowed for the gathering of an impressive corpus of data that supports the theory that mental images are actual re-creations, at the neural level, of real-world events, constructed in the absence of real-world stimuli. Although so far it has
been the study of visual mental images that yielded the most conclusive results, mental imagery is not limited to the visual modality. Researchers posit that the brain creates visual, auditory, tactile, etc. re-creations (ibid.); mental imagery is thus viewed as a main constituent of an “integrated and unified composite of diverse sensory images – visual, auditory, tactile, olfactory and others” (Damasio 1999:115).

The specialization of brain regions for the processing of sensorimotor information has been long known and categorized (Bloom 2001:9-23). The involvement of specific brain regions in the processing of speech and other aspects of communication was already under scrutiny in the second half of the 19th century (op. cit.:328-329). In the past four decades, neuroimaging has led to the discovery that mental images rely on the same neural circuits involved in actual perception. The overview of studies of visual mental images in the brain presented by Kosslyn et al. provides compelling evidence to support the assumption that “visual imagery evokes many of the same processing mechanisms used in visual perception” (2006:135). Other research not included in the mentioned overview further supports the idea of an overlap of the neural pathways involved in mental imagery and actual perception. Bunzeck et al. (2005) showed that auditory imagery and the perception of complex sounds share the same neural pathways. Helene et al. (2006) proved that imagery training without actual task performance has a similar effect on working memory and the acquisition of implicit knowledge as task performance.

Recent research suggests the possibility that mental imagery may be of potentially great interest for the study of human communication, as it may help explain the occurrence of human communicative behaviors outside the parameters of any existent
linguistic theory. Since the brain structures involved in mental imagery and sensory perception overlap, it might so happen that the needed sensory input for communication be supplied to the brain by depictive representations of perception (mental images) in the absence of actual stimuli. This would explain how, in the absence of input for learning to communicate (Coleman 2005:203-213), changes in internal properties nevertheless occur in some learners allowing them to develop new communicative abilities.

Experiment

In order to investigate further how learners learn to communicate, two related experiments were created and implemented by the author in collaboration with Douglas W. Coleman, professor of English at The University of Toledo, Ohio (Coleman and Postica 2006).

In light of the discussion above, we came to suspect that learners in traditional classroom environments lacking in comprehensible input (Krashen 1985) who are able to acquire communicative ability succeed in finding their way out of the Chinese Room (Klein 1986) when their brain compensates for the lack of appropriate external input. We wondered whether it were possible that learners make use of the translations that usually come with dialogues, sample sentences, exercises, etc., to create mental imagery which substitutes for “the information received in parallel” (op. cit.:44). Our assumption is that in the absence of external input that would directly trigger changes in the internal properties of the participant in the linkage, the brain uses any input it may receive to produce mental images that help induce those same changes and trigger the desired communicative behaviors.
Design. We set up two related experiments in which we used for input a system of signs and sounds that we named Térus. The need for using such input was generated by the necessity to eliminate from the very beginning the risk that any of the subjects tested might be familiar with the input to which they were to be exposed. Térus was created by professor Douglas W. Coleman who performed place of articulation rotations on Polish words while preserving a simplified grammatical structure based on Polish\(^1\), a method inspired by Saussure’s analogy of the chess game (e.g., [t→k], [a] remains unchanged, [k→p]; thus Polish [tak] becomes Terus [kap]). Térus dialogues used as input in the experiments are shown in Appendix 1.

The first experiment is a memory test meant to assess subjects’ ability to produce output identical to the previously observed output of a participant in the same type of linkage. The second experiment is a comprehension test meant to assess subjects’ ability to produce output that maintains the linkage open. Each experiment consisted of two stages. The training stage involved subjects, in what regards their externally observable behaviors, passively. The executive stage required subjects to become actively involved in a learning task.

Subjects. A total number of 161 subjects participated (Figure 2). The subjects were all students at the University of Toledo, both undergraduate and graduate, enrolled in composition as well as linguistics courses in the Department of English in the spring semester of 2006.

---

\(^1\) “Words” and “grammar” here refer to arbitrary symbols and rules, respectively, invented long ago by natives of the approximately same geographical area called at present Poland, as an explanation of their communicative behaviors.
<table>
<thead>
<tr>
<th>Experiment</th>
<th>Instruction Type</th>
<th>Total number of subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group 1 (experimental)</td>
<td>Group 2 (control)</td>
</tr>
<tr>
<td>Memory test</td>
<td>32</td>
<td>37</td>
</tr>
<tr>
<td>Comprehension test</td>
<td>47</td>
<td>45</td>
</tr>
</tbody>
</table>

Figure 2. Experiments and subject distribution.

**Procedure.** In the training stage in both experiments, subjects could see the written text of a dialogue between two characters named Ava and Gova while they were listening to the recorded conversation. The auditory input (the conversation between Ava and Gova was played three times in a row, at five second intervals. An example of a scene used in the training stage is shown in Figures 5 and 7. In the first part of the executive stage, subjects were given five minutes to study individually with a study sheet (Appendix 1) for a short quiz in which they were told they would have to assume Gova’s part in the conversation. In the second part of the executive stage, subjects actually took the quiz. In each experiment, two distinct groups of subjects were used, one experimental group and one control group. The training stage was identical for each group in both tests. In the first part of the executive stage in both tests, the instructions on how to study for the quiz differed between the two groups. The experimental group was given specific instructions to visualize while studying (Figure 3), while the control group was simply told to study in the traditional way (Figure 4).
Take five (5) minutes to study the dialogs. Try to learn Gova’s portions of the conversation so that you can reproduce her part on a quiz you are about to take.

As you study, try to visualize yourself there as a guest in Ava’s apartment. That is, try to imagine what you would actually see during the conversation.

Figure 3. Instructions for the experimental group.

Take five (5) minutes to study the dialogs. Try to learn Gova’s portions of the conversation so that you can reproduce her part on a quiz you are about to take.

You may use the vocabulary list if you find it useful, or you may simply focus on the dialog and its English translation.

Figure 4. Instructions for the control group.

The quiz in the memory experiment tested subjects’ ability to memorize sounds and printed symbols; the quiz in the comprehension experiment tested subjects’ ability to communicate effectively. Each quiz consisted of six multiple-choice items. For optimal performance in the memory test quiz, subjects had to recall Gova’s exact response and correctly identify it among the four choices given in each quiz item (Figure 6).
In the comprehension test, Gova’s exact responses were replaced with other possible answers (Figure 8). Each quiz item contained four choices out of which two were random; the other two partially matched Gova’s original part but only one choice was actually expected to fit the communicative situation, i.e., to trigger in Ava the desired reaction. To perform correctly in the comprehension test, subjects had to choose the only answer that avoided a breakdown in communication.
After the period of study, subjects turned in their study sheets and were handed out an answer sheet. For each of the six quiz items (samples of which are shown in Figures 6 and 8), subjects were instructed to circle in their answer of choice on the answer sheet then fill in a number of self-report items that were used as additional variables in the
statistical analysis. Six of the self-report items offered a check option (Figure 9); in the statistical analysis, a specific variable name was assigned for each of these items (Figure 10). *Picture* is the name of the variable that represents the use of mental imagery.

- I silently read the dialogs “out loud” to myself over and over.
- I tried to picture Ava and Gova having their conversation.
- I went over the vocabulary list, testing myself item by item.
- I covered up the next line of each dialog, to see if I could guess what it was.
- I tried to remember how Ava and Gova’s voices sounded as I read their lines to myself.
- I focused mainly on the Terus dialogs instead of the English, trying to remember how to translate them as I went.

Figure 9. Self-report items.

<table>
<thead>
<tr>
<th>read_aloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>picture</td>
</tr>
<tr>
<td>vocab_list</td>
</tr>
<tr>
<td>cover_lines</td>
</tr>
<tr>
<td>recall_voices</td>
</tr>
<tr>
<td>translate</td>
</tr>
</tbody>
</table>

Figure 10. Statistical variables for self-report items in Figure 9.

Two additional items required subjects to provide information relative to their previous learning experience (Figure 11). The answers were computed in the statistical analysis and two more variables were created. The variable named *FL_num* corresponds to the
The variable named $FL_{tot\ yrs}$ corresponds to the total number of years a subject had studied foreign languages.

**Results.** We calculated a variable called $tot\_accur$ to represent the total number of a subject’s correct responses to the multiple-choice items. The correctness of all test items correlated positively with their respective overall $tot\_accur$, indicating all items on both test instruments were reliable (Figures 12 and 13).

![Figure 11. Additional self-report items.](image1)

<table>
<thead>
<tr>
<th>Language</th>
<th>Number of Years Studied in School</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$tot_accur$</th>
<th>$it_accur1$</th>
<th>$it_accur2$</th>
<th>$it_accur3$</th>
<th>$it_accur4$</th>
<th>$it_accur5$</th>
<th>$it_accur6$</th>
<th>$tot_accur$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>.691(**)</td>
<td>.705(**)</td>
<td>.565(**)</td>
<td>.736(**)</td>
<td>.577(**)</td>
<td>.620(**)</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>69</td>
<td>69</td>
<td>69</td>
<td>69</td>
<td>69</td>
<td>69</td>
<td>69</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

![Figure 12. Correlations: Memory Test.](image2)
<table>
<thead>
<tr>
<th></th>
<th>it_accur1</th>
<th>it_accur2</th>
<th>it_accur3</th>
<th>it_accur4</th>
<th>it_accur5</th>
<th>it_accur6</th>
<th>tot_accur</th>
</tr>
</thead>
<tbody>
<tr>
<td>tot_accur</td>
<td>Pearson Correlation</td>
<td>.324(<strong>), .306(</strong>), .588(<strong>), .557(</strong>), .503(<strong>), .411(</strong>), 1.000**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.002, .003, .000, .000, .000, .000, 1.000**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>92, 92, 92, 92, 92, 92, 92</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).

Figure 13. Correlations: Comprehension Test.

From `tot_accur` we derived another variable named `accur` that represents a measure of a subject’s accuracy of response. We considered a correctness level of 80% and above in the responses as mastery level. Thus, if a subject had 5 or 6 out of 6 items correct, we interpreted that as high accuracy and assigned the variable `accur` the value 1. If a subject had fewer than 5 correct items, we interpreted that as low accuracy and assigned the variable `accur` the value 0. Nine factors were considered as possible predictors of accuracy (Figure 14): the eight variables mentioned above, plus the type of instruction the subjects received. In the statistical analysis, the type of instruction was assigned a variable called `instruct_type`, with the values of 1 for `VISUALIZE` (the experimental group) and 2 for `STUDY` (the control group).

```
instruct_type          recall_voices
read_aloud             translate
picture                FL_num
vocab_list             FL_tot_yrs
cover_lines
```

Figure 14. Possible predictors of accuracy.
We performed a discriminant analysis (stepwise) to identify predictors of accuracy. For the memory test, only the amount of foreign languages a subject had studied (represented by the variable \(FL\_num\)) was retained by the calculation and was a significant predictor of accuracy: Wilk’s \(\lambda = 0.943\), Exact F = 4.024, df1 = 1, df2 = 66, \(p = 0.049\). For the comprehension test, only subjects’ use of mental imagery (\(picture\)) was retained by the calculation as a predictor of accuracy: Wilks' \(\lambda = 0.953\), Exact F = 4.391, df1 = 1, df2 = 90, \(p = 0.039\). According to t-test results, subjects who showed high accuracy in their quiz answers (\(accur\) value of 1) had studied foreign languages for a longer period of time (\(FL\_tot\_yrs\)) than subjects who showed low accuracy (\(accur\) value of 0): \(t = -2.243\), df = 67, \(p = 0.028\). They had also studied more foreign languages (\(FL\_num\)) than subjects who showed low accuracy: \(t = -2.321\), df = 54.509, \(p = 0.024\). Further results showed no relationship between a subject’s use of mental imagery (\(picture\)) during the study phase and their accuracy of response (\(accur\)) on the quiz: Fisher's Exact Test, \(p = 0.419719\), \(\chi^2 = 0.36\), df = 1, \(p = 0.5500\).

**Conclusions.** The results of the experiment seem to indicate that learners who prove successful in acquiring a certain degree of communicative ability in the absence of comprehensible input (Krashen 1985) do undergo a change in internal properties that allows them to produce output that maintains the linkage open. In other words, learners who use mental imagery while studying a communication task are able to develop specific communicative behaviors that allow them to avoid breakdowns in communication. When the concern for replicating exactly the input received is removed and the learners are free to choose the output that in real-world interaction has the highest chance to allow communication to continue, learners do so with the focus on triggering...
expected changes in the internal properties of the participants in the linkage and without any concern for the arbitrary grammaticality of that output.
Chapter 4
Implications for Learning

Old habits are hard to break. Accepting the fact that ‘language’ is nothing more than an explanation of human communicative behaviors created by humans themselves is bound to have a profound impact not only on the field of linguistics, but also on the related fields known today as of second language acquisition and second language teaching. Human linguistics puts forth a theoretical framework for the scientific study of human communication. Research in the physical domain appears to validate the framework. It is now time to design a method for classroom teaching which, based on the theoretical framework, will yield results that withstand the test of the physical reality.

“New theory, new teaching method” is not a new concept in second language acquisition and teaching. For the past century or so, much has been thought and done to find the best way to teach a foreign language. “As disciplinary schools of thought – psychology, linguistics, and education, for example – have come and gone, so have language-teaching methods waxed and waned in popularity” (Brown, 2001:16). Teaching methods are the practical application of theoretical findings and approaches. For over a century, approaches have been based on the premise that communication happens through language and teachers across the globe have strived to teach language in the
classroom. Designing a method based on the theory of human linguistics does not imply the introduction of yet another method for language teaching. It implies eliminating once and for all false assumptions about “language” and “language acquisition”, and reshaping the essential premise for classroom teaching so that it mirrors the reality of communication. The absence of language as an object of the physical domain (Yngve, 1996) brings a completely new perspective to classroom teaching. Learners for the first time will have the chance to understand what happens when people communicate and to develop specific behaviors that allow them to interact communicatively with people other than members of their native community. Nothing is ever completely new; there is a lot of good material in the plethora of already existent methods in the field SLA that should be preserved and adapted to fit the reality of the study of communication.

Most learners enroll in second or foreign language classes out of a need to become able to “get along communicatively” (Yngve 1996:125) with natives of a different geographical region (e.g., Germany, France for a U.S. citizen, Québec for a native of Ontario). Rather than teaching learners a collection of arbitrary concepts that purportedly help explain communication via language, a method for communication learning based on human linguistics theory will, by its very nature, allow “carry over” from communication learned in the classroom to communicative situations outside the classroom.

**Classroom teaching**

Yngve’s human linguistics demands the radical alteration of the traditional second language classroom so that it mirrors the reality of everyday communication. At present,
the main classroom objective is the teaching of language by a teacher to learners; in Chomsky’s terms, a person who knows the language uses it to expose learners to it and at the same time imparts knowledge of the grammar of the language to those learners, who will acquire the grammar and thus know the language generated by that grammar (Chomsky 1975).

Yngve’s approach calls for a different classroom scenario, in which the main classroom objective becomes facilitating the development, in learners, of abilities to appropriately manifest specific communicative behaviors in linkages and appropriately react to the communicative behaviors of other linkage participants. These behaviors will allow learners to interact as fluently as possible, outside the classroom, with individuals who use the behaviors targeted in communication within their native community. In this scenario, the teacher ceases to be the imparter of knowledge and holder of an absolute model against which all learner production is to be measured; in turn, the learner ceases to expect knowledge to be handed down by the teacher as well as acquisition of an elusive form of matter (previously referred to as “language”) to happen. Instead, both teacher and learner become communicating individuals engaged in negotiating meaning in realistic communicative situations. The static traditional classroom environment, which allows mainly for the passive practice of skills, becomes a dynamic environment that replicates human interaction.

The technique of simulation described by Jones (1982:5) and defined as “reality of function in a simulated and structured environment” is the paramount practical application for the theoretical approach proposed by human linguistics. By reality of function, Jones means that participants in a simulation “must step inside the function
mentally and behaviorally, and do the best they can to carry out their duties and responsibilities in the situation in which they find themselves” (op. cit.:4). In other words, participants must stop thinking of themselves as learners in a classroom and start envisioning themselves as postman, bank teller, etc. They are not to “imagine” that they are in a certain time and place, but instead visualize themselves truly there and deal with the issues inherent to the situation. Simulation implies no pre-determined outcomes and allows for real negotiation of meaning in real-world communication. In a simulated environment, there exists no authority figure to help with problem-solving and decision-making; learners are completely in charge of communication the same way they would be in the real world. Teachers do not exist in the real world to make corrections and offer guidance; they cannot exist in a simulated environment either. Simulations allows for learners to be placed in realistic situations. It must not allow though, for learners’ interaction to have an impact outside the simulation. For it to work, a simulation must be safe and free of consequences outside the simulated environment. “In order to fulfill the essential condition of being a simulated environment, there must be no contact, interaction or consequences between the participants and the world outside the classroom” (op. cit.:5). Reality of function and separation from the outer world cannot be achieved without a clear, rigorous structure. In simulation, the communicative situation must be laid out clearly and in detail, and the roles of the participants must be clearly defined. Nothing is to be left to the learners’ imagination: “The essential ‘facts’ of the simulation must be provided, and not invented by the participants” (ibid.); everything is set from the beginning except for the outcome, so that the learners can work together to create an outcome that fits the structure of the situation. Simulation in communication
learning is not to be mistaken for role play in language teaching. They are essentially
distinct techniques. Simulation is “an event. It is not taught. The students become
participants and shape the event. They have roles, functions, duties and responsibilities
… within a structured situation involving problem solving and decision making” (op.
cit.:2). As such, in human linguistics terms, teacher and learners alike become
participants in linkages within the simulation. Their task is to produce appropriate inputs
and outputs so that the linkages remain open. They can do so by exchanging energy only
along the channels provided and using exclusively the props provided within the given
structured confines of the simulated environment. No influence from outside the set
structure is allowed; learners are not permitted to imagine or improvise channels and
props, or to modify in any way the setting in the simulation.

As opposed to simulation, role play involves imagining a situation where both
facts and outcomes are given, and where no unknown is introduced. The learners are
supposed to use the given facts and negotiate their way by means of “language” in order
to come to the known conclusion. Learners’ communicative behaviors are supposed to
follow patterns already established by the teacher and the textbook, and correctness of
“language forms” remains everyone’s primary concern. Role play supposedly
consolidates “language” in the learner and helps transfer it from short-term memory to
long-term memory, where it is stored for later use. Advocates and practitioners of role
play fail to see the false premises on which this approach lies. First, there is no language
in the physical domain to be used and stored in the brain (Yngve 1996). Second,
negotiation always implies the risk of failure (Kennedy 2004:1-6). With every detail pre-
determined and the final outcome known, role play leaves no room for failure, and thus no room for realistic negotiation of meaning.

**Teacher training**

In order to adequately prepare future specialists for the classroom reality in communication learning, college programs need to make the exploration of the true nature and mechanisms of human communication one of their primary goals. In a first step, this could be accomplished by introducing, as program requirement at master’s and doctoral level, a course that discusses human communication from the perspective of brain, biology, and behavior.

The brain is “an organ specialized to help individual creatures carry out major acts of living” (Bloom 2001:8) which, research has shown, is fundamentally involved in human communication. “Clearly, knowledge of how this organ works and what can be done to make it work efficiently in artificial situations, such as classrooms, is vital knowledge that has concrete implications for designing methodology, textbooks, syllabi, learning materials, etc.” (Danesi 2003:22).

An overview of historical views of the brain as well as a gross anatomic and physiological review of the organization of the human brain and nervous system will provide future communication learning specialists with information that allows them to approach human communication on a scientific basis and will unmask, once and for all, the falseness of the “language organ” assumption on which Chomsky’s research and that of his followers builds on. An overview of the neurobiology of the brain will allow a glimpse into the physical reality that unfolds beyond our conscious reach when humans
communicate. Information about brain activity obtained with the help of modern technology will help future communication learning specialists form a clearer understanding of the on-going processes in a learner’s head, which will eventually lead to the development of more efficient approaches to classroom teaching. An overview of the stages of human development will provide students with a basis for the understanding of communication at younger ages and help them build more successful strategies for teaching young learners. Finally, the study of basic human biology will emphasize the relationship of the human brain with the rest of the human body and will facilitate understanding the role particular anatomic structures play in human communication, thus aiding in the general understanding and explanation of everyday human communicative behaviors. A solid understanding of human biology will eventually make possible the development of a truly scientific approach to both theoretical research and classroom practice in communication learning.
References


Cairns, Helen Smith. 1996. The acquisition of language. Austin, TX: PRO-ED.


Appendix 1
Study sheet for the experiment

Notes: the accent mark shows stress; "ē" is pronounced "ee" as in meet; "a" is always "ah", never like the sound in "cat".

The Dialogues: Gova is visiting in Ava's apartment

Ava: Wógmeh kélka?  Ava: A biscuit?  [She offers a biscuit.]
Gova: Kap, gzampéwan.  Gova: Yes, thank you.
Ava: Tléšan.  Ava: Here you are.  [She gives it to Gova.]
Gova: Dálgoz gzampéwan.  Gova: Thanks a lot.

Later:

Ava: Wósteh sholdáka?  Ava: More tea?
Gova: Gzampévan.  Gova: (No,) thanks.
Ava: Ey, tléšan.  Ava: Oh, please.  [She holds out the teapot.]
Gova: Mwo, gzampéwan.  Tlózgo!  Gova: No thanks. Really!

Even later:

[Gova notices the time.]
Gova: Ey, tlotlásan.  Nísan zlíkfat.  Gova: Oh, excuse me! I have to go (back home).
Ava: Mwo, tléšan shkarót-zo.  Ava: No, please stay.
Gova: Dálgoz tlotlásan! Mwo nísan.  Gova: I'm very sorry. I can't. [literally mustn't.]
Ava: Meh, keh. Ta!  Ava: Well, then. Bye!

Review of Vocabulary

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ey</td>
<td>oh</td>
</tr>
<tr>
<td>eshkákmwo</td>
<td>(see you) later</td>
</tr>
<tr>
<td>dálgoz</td>
<td>very, a lot</td>
</tr>
<tr>
<td>gzampéwan</td>
<td>thanks, thank you (gzampéwat = to thank)</td>
</tr>
<tr>
<td>kap</td>
<td>yes</td>
</tr>
<tr>
<td>kélka</td>
<td>biscuit, cake</td>
</tr>
<tr>
<td>Meh, keh.</td>
<td>Well, then.</td>
</tr>
<tr>
<td>mwo</td>
<td>no, not</td>
</tr>
<tr>
<td>mwo nísan</td>
<td>I can't / I mustn't (nisat = to have to)</td>
</tr>
<tr>
<td>Word</td>
<td>Meaning</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>shkarót-zo</td>
<td>stay (literally &quot;stay-yourself&quot;)</td>
</tr>
<tr>
<td>sholdáka</td>
<td>tea</td>
</tr>
<tr>
<td>Ta!</td>
<td>Bye!</td>
</tr>
<tr>
<td>tlésan</td>
<td>please, here you are/go</td>
</tr>
<tr>
<td>tlotlásan</td>
<td>excuse me, I'm sorry</td>
</tr>
<tr>
<td>Tlózgo!</td>
<td>Really!</td>
</tr>
<tr>
<td>wógmeh</td>
<td>some, a, a few</td>
</tr>
<tr>
<td>wósteh</td>
<td>more, additional</td>
</tr>
</tbody>
</table>