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Do they get the picture?: Visual literacy and low-literacy adult ESL learners

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DO THEY GET THE PICTURE?

VISUAL LITERACY AND LOW-LITERACY ADULT ESL LEARNERS

by

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CHAPTER ONE: INTRODUCTION

"Y es que en el mundo traidor nada hay de verdad ni mentira: todo es según el color del cristal con que se mira." -Ramón de Campoamor (1817-1901) (de Campoamor, 1900)

As a Spanish language student, I was required to memorize this famous saying. It approximately translates, "In this treasonous world, nothing is truth nor lie. It all depends on the color of the glass you're looking through." Essentially, everything you see is influenced by the lenses through which you see it. By looking through a colored lens, the world takes on that color. By extension, that means that those with the same-colored lenses see the world in much the same way. Those who see through glass of another color possess a different concept of the truth. As an American teacher of students from other countries, I see that my students' views of the world differ from my own, and from each others'. The purpose of this research is to determine how educational background factors influence the ways that students interpret some of the visuals used in class; to find out how their lenses differ.

The majority of the students I teach are adult refugees from Somalia. Most of these English Language Learners (ELLs) never had an opportunity to go to school at any time in their lives until they reached this country. They cannot read in their first language (L1). Consequently, many are learning to read for the first time in any language. The first language non-literate (L1NL) learners are also being introduced to the routines of

education to which their L1 educated peers are more accustomed. For example, most L1-educated learners of western cultures instinctively open a book from the front cover. They address a page starting at the top and work toward the bottom, and from left to right. They automatically take a seat facing toward the front of a classroom. These are routines that are automatic for those of us who have been in classrooms and who have used books, but these basics need to be learned by (and thus taught to) learners who are new to formal education. I know this because I have found myself recommending to a learner that she face the front of the class. These are classroom competencies that are easy to see and almost as easy to remedy, but might there be other more subtle shortcomings in educational competence that a teacher doesn't see as easily? Could non-literate learners even see differently?

Teachers in all subjects take advantage of visual images to facilitate learning. Harrison (2003), in her article about how still images make meaning, explains that, "readers/users no longer rely solely on written text for comprehension; they absorb and process all that they see within a document to create meaning for themselves." In language teaching, especially at the beginning and pre-literate levels, communication can be impossible without non-verbals, including printed pictures. It is often assumed that visuals represent a language that everyone can understand, and in many cases, that is true; a picture of a dog is a picture of a dog. But to some, that dog represents a family member that is welcome to sleep on the bed, while to others it is a dirty street animal to be despised or feared, but certainly not to be allowed in one's home. A person's background influences the way she sees a picture. If a person has only known a dog as a mangy stray

animal, she would have no reason to think of it as a warm, loving creature. Similarly, I think a person's L1 education may have some influence on the way she sees some of the pictures we use in English classes. If a learner has never used a textbook, she will see it in a way distinct from those who have had access to books from childhood. To the L1 non-literate learner, the pictures and graphics used in those books may be as foreign as the words printed in them.

In the classes that I teach, pictures are often used to scaffold content. Pictures can convey meaning when words fail. They provide a way to stimulate background knowledge and prepare learners for reading. Pictures provide good jumping-off points for speaking, listening and writing. In doing those activities, I've noticed that the ways learners describe pictures are not always what I expect. When using complex, situational pictures in textbooks or screen projections, students notice and comprehend some visual elements but seem to require explanation for others. At first I only thought this was a function of language, of not being able to describe, at least in English, the things they were seeing. It didn't occur to me that there might be a pattern in the types of visuals understood and those that weren't.

When I read Hvitfeldt's (1985) article, *Picture Perception and Interpretation Among Preliterate Adults*, I was immediately intrigued. Hvitfeldt's proposition that learners of other cultures and other literacy backgrounds might see visuals differently struck a chord with me in what I was seeing in class. I wondered if the learners in my classes would see the pictures I use in class in a different way if they had been exposed to formal education in their L1.

In Adult Basic Education (ABE) classes, the curricular focus is on life-skills. Progress is assessed via the Comprehensive Adult Student Assessment System (CASAS), an adult life-skills literacy test. As a result, most lessons revolve around personal information, health, job skills, consumer economics and community. All of these areas make use of visuals, printed and non-. The tests given to ABE learners reflect that reality. The world around us is filled with nonverbal and non-print information that helps us navigate society. Around the same time that I read the Hvitfeldt article, I rescued one of my female learners from the men's restroom. I was amazed that even the symbols for male or female could be confused, something that I thought was universal.

With the growth of the internet, we are living in an increasingly visual culture and an increasingly international world. There is a need for visuals to be understood not only in our multicultural classrooms, but also across borders. Teachers need to have visuals communicate the meanings that are intended. Those who wish to visually communicate internationally likewise, cannot afford to be misunderstood. As visuals are relied upon instead of, or in addition to text, non- and low-literate people are more easily reached. It is important for a communicator to know which visuals are effective among people with different cultural and educational backgrounds.

The visuals we use to facilitate communication among diverse backgrounds can themselves be sources of confusion. I was told a story by someone who accompanied a pair of newcomers from Somalia to have their eyesight examined. They were shown a picture of a birthday cake and were asked to identify what it was. Since the cake didn’t resemble any cake they had ever seen, not to mention that birthdays aren’t generally

celebrated in the culture of the eye-examinees, the picture was useless. The patients recognized the illustration as a bunch of black writing on a white page. The eye doctor offered an alternative visual, that of arrows pointing left, right, up and down, and asked which way each of them was pointing. The examinees again didn't recognize that each arrow indicated a relative direction and only saw a collection of black lines (I. Osman, personal communication, April 20, 2011). The lifetime experiences of these individuals did not include the use of the arrow as a graphic device to show direction.

Just as the visual materials used by an eye doctor can be confusing for some patients, the visuals used in educational materials may be confusing to students. This study examined some images from beginning adult English as a second language (ESL) materials. The aim was to determine if L1 non-literate learners see these images any differently from how L1 literate learners see them. Specifically, the research focused on typical graphic devices that visually literate Americans might assume to be universal. The researcher wanted to discover how L1NLs interpret these graphic devices and see if their interpretations differ from those of their L1L peers. It was hoped that the study would help shed light on how the illustrations used in ESL materials are understood by the learners for whom they are intended. As frustrating as it is for a teacher when the learners don't understand something, it is even more frustrating for the learner when he doesn't understand. If teachers can use materials with visuals accessible for L1 literate and non-literate, they can focus on the issues of language and literacy.

The following literature review section discusses the meaning of literacy and how it compares with and relates to the multi-disciplinary field of visual literacy as it relates to

the type of learner typical in my classes. The number of ideas presented by the authors cited suggests just how difficult it is to define either literacy or visual literacy; yet, the concepts of literacy provide background for a discussion of semiotics, the study of how meaning is created. The ideas of semioticians are visited to categorize the kinds of signs encountered by learners, visual and otherwise. The language of signs aids in a review of cross-cultural and non-verbal communication. Research is reviewed on the influence of cultural origin on the interpretation of visuals. Some literature from the field of language education is discussed with a focus on the influence of L1 literacy on learning a second language. Chapter 3 describes the methods used to conduct this research on the visual literacy of adult second language learners. Participants from L1 literate and L1 non-literate backgrounds are asked to interpret and discuss a number of images containing graphic devices commonly used in the United States. Chapter 4 presents and discusses the results of the data collection. In chapter 5, the major findings of this research are presented and the implications and significance of the data are interpreted.

CHAPTER TWO: LITERATURE REVIEW

This research brings together fields that aren't often found together, but all relate to ways of gaining information. This chapter begins with a review of the literature on literacy and visual literacy. The philosophy of semiotics is introduced and its terminology is used to categorize visuals encountered by learners. Some scholarly viewpoints on the importance of visual communication in education are presented and related to second language education and cross-cultural communication. Finally, this review looks at the relationship of L1 literacy to L2 acquisition, which leads to the purpose of this study: to determine whether L1 literacy also affects visual literacy of the L2 culture. The aspects of visual literacy under examination in this study are the American cultural conventions of visuals used in conveying information, specifically the graphic devices commonly used.

Students who have little formal education experience an ABE class in a way that differs from their classmates. It is the belief of the researcher that this difference extends to how students see pictures and interpret graphics used in class. In the state of Minnesota the mission of Adult Basic Education is to provide adults with educational opportunities to acquire and improve their literacy skills necessary to become self-sufficient and to participate effectively as productive workers, family members, and citizens (Minnesota Literacy Council, 2010). Each of those adult learners comes to ABE with different experiences and a different set of skills. The ABE teacher has very little choice about

who makes up his class. Whoever walks in the door is his student. Learners may be placed by level, according to some initial assessment, but all other background factors may be as varied as the names on the roster. They may represent a dozen home countries and a dozen first languages. Their ages may range from 16 to 90-plus (Mathews-Aydinli, 2008). Their home and work situations vary. Motivations for attending, ability to regularly attend, and degree of cultural assimilation differ from learner to learner. According to the assessment used to place learners, a group of learners may be identified as representing the same English level, and are thus placed in a single class, but their L1 education may range from none at all to post-secondary degrees. All of these factors contribute to the composition of an ABE class with a wide range of experiences. Those experiences color the ways that students learn, including even the way they see things.

This chapter discusses some characteristics of adult language learners with low or no L1 literacy, as well as those with prior education. Literature from the fields of visual communication, semiotics and visual literacy is reviewed with emphasis on how it relates to cross-cultural communication and language learning. In order to ground the discussion of these specific learners and their language and literacy acquisition, this chapter begins with an examination of what literacy means.

Literacy

Although in many countries the majority of immigrants are low-educated, the body of research on second language acquisition (SLA) has focused primarily on learners who are educated in their first language to at least the secondary level (Bigelow & Tarone, 2004). This could be due to the fact that most researchers are themselves located

at institutions of higher learning and have more access to, and more interest in, studying learners with higher levels of education (Mathews-Aydinli, 2008). These scholars don't often interact with adult learners who have little education. Also, studying adult learners with little education presents its own particular set of problems. In conducting research on illiterate learners there are complicating factors in recruitment, consent and other cultural barriers (Bigelow & Tarone, 2004). The result is a dearth of research on the learners who, arguably, need the most help. Professionals in the field agree that little is known about adult ESL literacy students and that more research is needed on those who are learning English but have little or no education in their first language (Bigelow & Tarone, 2004; Bigelow & Vinogradov, 2011; Condelli & Wrigley, 2003; Tarone, 2010).

Literacy Statistics

The word *literacy* is far from an exact term; its meaning changes relative to the context of the conversation and on the background of those who are doing the defining. The United Nations Human Development Programme's 2009 Human Development report (UNHDR) lists adult literacy rates of the nations of the world. Though not every country has a figure listed, the numbers that do appear give an idea of the range of literacy levels around the world. The highest (Georgia) is 100 percent. The lowest (Mali) is 28.2 percent. The data comes with an asterisk though, admitting that differences in methodologies and data make accurate comparisons between countries difficult. An often-cited historical truth is that not so long ago in our country, a person was considered literate if he could sign his own name (Flood, Lapp, & Bayles-Martin, 2000). Literacy is a term that is defined by the culture one is in and, perhaps in the case of United Nations

reports, by the people doing the reporting. The CIA world fact book, which also lists world literacy rates, uses the definition "age 15 and over can read and write." Its data claims the United States' literacy rate to be 99 percent (Central Intelligence Agency, 2011, United States section). The 2003 National Assessment of Adult Literacy (NAAL), which included more than 19,000 adult participants, shows contrary data. These contrasting numbers are at least partly due to differing definitions of literacy. The NAAL was designed to measure *functional literacy* of three types: prose literacy, document literacy, and quantitative literacy**.** Assessment items were meant to reflect the kinds of printed materials commonly encountered in daily life. Results showed that 14 percent of the participants demonstrated skills below those of basic literacy (Kutner, Greenberg, & Baer, 2005) .

Problems in Defining Literacy

The abilities necessary to thrive in society differ depending upon which society one finds oneself in. Predominantly oral cultures have values distinct from those that rely on print. Bigelow and Watson describe an *abyss* of difference “between ways of being that are highly oral and those that are hyperliterate" (as cited in Bigelow, 2010, p. 55). Most people would agree that in our culture, the concept of *literacy* is valued. Vinogradov refers to it as, "a critical part of American culture" (2008, p.7). As a rule, literacy is thought of as the ability to read and write, but even that simple definition leaves room for interpretation. There is a need for a determination of the level at which a person can perform those actions. A typical second grader can read and write, but isn't literate in the same way that a high-school graduate is. That invites the question of

whether the simple mechanical ability to produce and decipher words constitutes literacy, or if broader critical and creative thinking should be demonstrated. Perhaps literacy isn't an ability that one has or doesn't have, but is more of a point on a scale. Either way, it is a term that is redefined according to what stakeholders want it to mean. The 1998 Workforce Investment Act (WIA) defines literacy as "an individual's ability to read, write, and speak in English, compute, and solve problems, at levels of proficiency necessary to function on the job, in the family of the individual, and in society" (Workforce Investment Act, 1998), a definition very similar to that of *functional literacy.*

Gunther Kress, Professor of Semiotics and Education, has questioned whether the term literacy has any descriptive use at all, if it is applicable to so many areas (2000). Kress takes issue with the many uses of the term literacy. For one, he mentions, "the term has no equivalent in non-Anglophone cultures" (p. 403). The concept that we call literacy is often described in terms relating to *culture* or *education.* But even in English, he says, there are many literacy viewpoints. He mentions how the many uses of the word, (computer literacy, visual literacy, media literacy, cultural literacy, emotional literacy, health literacy etc.) while seeming to offer a point of commonality between disciplines, actually obscure the "deep differences" between these areas. Warriner (2007) also believes that the definition of literacy shifts as stakeholders define it for their own purposes. He has been critical of the way that ABE programs have defined literacy in terms of higher life skills test scores. He contends that the current focus on getting learners into jobs as quickly as possible prevents learners from learning more than the very basics of language that constitute literacy. Auerbach and Burgess (1985) wrote

about hidden social agendas in ABE, going so far as to assert that the "survival ESL" curricula used in ABE programs serves to prepare learners for subservient roles and discourage the development of critical thinking skills. The term *literacy,* as interpreted in the context of ABE or in the broader field of education, eludes an agreed upon definition.

Cultural Literacy

ABE tests assess skills other than reading and writing. The lowest level CASAS tests have very little reading involved at all, and could be said to be tests of cultural literacy. There are scholars, E.D. Hirsch being chief among them, who believe that cultural literacy needs to have more focus in our schools: that students need to develop a broad range of knowledge. Hirsch (1987) is critical of education that emphasizes *skills* to the neglect of specific shared learning, known as *core knowledge.* He contends that effective communications require shared knowledge, or shared culture. Hirsch wrote that literate culture is, "the ticket to full citizenship"(p. 22). Commonly used visual symbols are part of cultural literacy and might be included in what Hirsch calls core knowledge.

Of the things we see in daily life, very few of them are words. We learn to read the non-print things we see using what could be called a subset of cultural literacy: visual literacy skills. Feldman (1976) argues that the fact that many semi-literate and illiterate people can cope successfully with their environments suggests, "that they have learned to read nonverbal, essentially visible languages" (p. 199). As of yet, there has been little research to show how semi-literate and illiterate people gain information from non-print sources in their environments.

Visual Literacy

Just as the meaning of *literacy* is debatable, the term *visual literacy* is just as difficult to define. John Debes, the founder of the International Visual Literacy Society (IVLA), coined the term in 1969. He proposed the following as a definition:

> Visual Literacy refers to a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, symbols, natural or man-made, that he encounters in his environment. Through the creative use of these competencies, he is able to communicate with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the masterworks of visual communication (as cited in Ganwer, 2009, p.2).

That first definition of visual literacy seems fairly all-encompassing. It includes the interpretation of visuals as well as the production thereof. Ganwer also feels that "full spectrum" visual literacy requires one being able to not only understand visual communication but also to use visual imagery to communicate. He says that a person "becomes visually literate by the practice of visual encoding (expressing thoughts and ideas in visual form) and visual decoding (translating the content and meaning of visual imagery)" (Ganwer, 2009, p.3). In ABE some common types of visual decoding that are focused upon in ESL classes are those of reading maps and signs. According to Ganwar's definition of visual literacy, simply being able to interpret those visuals is not enough. A

learner would also need to be able to visually encode, in this case create maps and signs, to demonstrate "full spectrum" visual literacy.

Visual literacy, like the word *literacy*, changes its meaning according to who is using it. Advertising, anthropology, art and the many fields of education naturally see visual literacy through different lenses. Brill, Kim and Branch (2007), finding that there was no definition that was agreed upon by the visual literacy scholarly community, challenged the IVLA to construct and adopt an operational definition of visual literacy. Until that day comes, most definitions contain two major elements; the ability to understand visuals and the ability to create visuals. Messaris and Moriarty (2004) draw a parallel once again to print literacy, stating that these two elements, "are akin to reading and writing in language literacy" (p. 482). Arbuckle (2004) claimed similar analogies, "If pictures are a visual language, then the basic visual elements we use to make a picture can be likened to the letters and words that form sentences and meaning" (p. 449). These scholars see the acquisition of visual literacy as similar to, if not the same as the acquisition of print literacy. They believe that learning to understand and create images are much like reading and writing.

Differences and Similarities among "Literacies"

Though Messaris, Moriarty and Arbuckle make it appear that the acquisition of language literacy and visual literacy are similar processes, there is substantial opposition to the idea that they can be compared. In his book, *The Primer of Visual Literacy*, Dondis (1974) asserts that visual literacy can never "be a clear-cut logical system similar to language," since languages have structure and logic that visual literacy can't parallel (p.

12). Kress (2000) also argues that language and visual communication are not analogous systems. He argues that speech uses a fully articulated and systematic mode of communication that most nonverbals don't have. For example, nonverbal communication, such as drawing and gesturing (except for sign languages), do not have such grammar systems. We can't easily point to the building blocks of visual communication as we can with oral communication made up of phonemes, syllables and words or with written language formed (at least in English) by letters, words, and sentences. Though a picture is said to be able to tell a story, the individual elements that make up that story are not easily defined. Drawing is taught in schools more as an aesthetic mode of expression than as a mode of communication. Gesturing is another form of nonverbal communication. In the case of the languages of the hearing-impaired, gestures do represent a complete and productive mode of interaction with building blocks that can be learned.

People gain a great deal of information from non-print sources. In fact, children learn to "read" pictures long before they are able to read words. They learn to recognize *logographs*, symbols that represent entire words or phrases, for instance the symbol "4" represents the word "four." Children are able to use this logographic reading to recognize signs and logos such as a stop sign, the Pokémon logo, the McDonald's arches or the desktop icon for a favorite computer game. It has been suggested that this type of reading facilitates the development of actual reading of words. Cronin, Farrell and Delaney conducted a study in which children were taught to read some logographs. The children were also taught the same words as sight words. The children learned the words presented in a logographic context more quickly than those who learned the words

without context. Through further study Cronin et al. were also able to conclude that the learning of the logo in-context permitted transfer to reading the words without context (in Pressley, 2006). Such research indicates that "reading" pictures, or developing visual literacy, is a step along the path of reading development.

The visuals we use are arbitrary signs that individual societies have invented (see next section on semiotics). Dondis (1974) notes that only *spoken* language evolves naturally. He cites Noam Chomsky's work in linguistics indicating the innate ability to learn language. "Verbal literacy, reading and writing, must, however, be learned through a number of steps. First we learn a symbol system; abstract shapes that represent designated sounds" (p. 8). The research described in this paper is focused on another symbol system; that of graphic devices. This paper intends to provide insight into how having a history of learning a print symbol system affects the interpretation of this other symbol system.

Semiotics

In his work on what children learn when learning to write, Kress (1993) writes, "In culture -- and literacy is a cultural phenomenon in simply all its facets-- everything has meaning; nothing we see is without meaning" (p. 154). Letters are signs that represent sounds. Putting those signs together makes other signs: words. Other, non-alphabetic languages have written signs (logographs) that represent words directly. But as mentioned in the above discussion of literacy, there is more to communication than the printed or spoken word. We "read" other visuals as well.

Semiotics is the study of signs. Although the term includes printed material and street signs, those are only small parts of what semioticians call *signs.* A sign can be body language or even a spoken word. According to Moriarty (2004), it is "anything that stands for something else" (p. 228). The linguist Ferdinand de Saussure described a sign as being made up of two elements: the *signifier* and the *signified* [see Figure 1]. He used *tree* to illustrate the concept. The sign *tree* has a signifier; this can be the spoken word "tree," the written word, a visual depiction or even a gesture, if that is possible. Thus, the *signifier* is whatever mode is used to communicate the sign. The *signified* is the concept or content behind the sign; in Saussure's example, the idea of "treeness" (Moriarty, 2004). So, each sign has a signifier, that is the sensory form taken, as well as a signified, which is the meaning. Going back to the alphabet, in English the written or spoken letter 'f' is the signifier. The signified is the concept of what an 'f' is. It can signify the sound made by the letter, a part of the alphabet, a note on a musical scale, a grade on a report card or just an odd squiggly line. For a person literate in English the sound that it makes can be signified by the sign 'f'. If a person doesn't know the English alphabet, perhaps some other meaning will be interpreted by that signifier. Saussure's model is a basic conceptual one that doesn't explicitly note the possibility for multiple interpretations of a sign, but the arrows on either side of the diagram indicate the interrelationship between the two elements. The implication is that the signifier and signified are directly connected but the relationship between them is arbitrary.

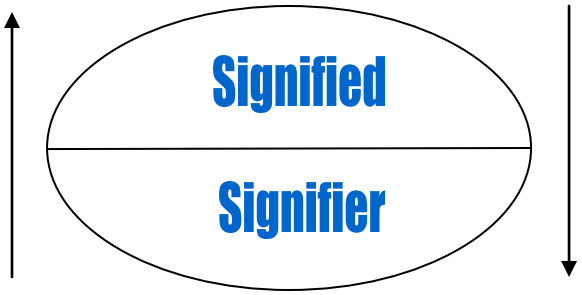


Figure 1. Saussure's sign model.

Note: Author's visual based on Saussure's idea, as described in Moriarty (2004).

Peirce's Sign Model

Charles S. Peirce presented a semiotic model that does provide for the view of the person interpreting the sign. In his triangular model of a sign, the concept similar to Saussure's signifier is simply called *sign*. What Saussure called the signified is described as *object.* Where the conceptual models differ is that to Peirce, the sign does not exist without an *interpretant*, the third element in his triangle [see figure 2]. The interpretant is the idea evoked in a person's mind by the sign (Moriarty, 2004). The idea evoked in one person's mind can be different from that in another's mind. Taking Saussure's tree as an example, one person may interpret the sign "tree" as an autumn-colored sugar maple while another might imagine a gnarled, leafless oak in winter. In other parts of the world, people might see a lone baobab tree or a dense rainforest. Peirce's model proposes that experience influences how signs are interpreted. It mirrors the theory of constructivism, in which learning is seen as a continual process of construction and reconstruction of knowledge as a person interacts with information. As one reads, meaning is created through the interaction of the text and the reader. This interactive process is key to this

study. Using the terms of Peirce's sign model, this research focuses on the *objects* (meanings) that are constructed by *interpretants* (the ideas of the viewers) as they interpret *signs* (the images seen).

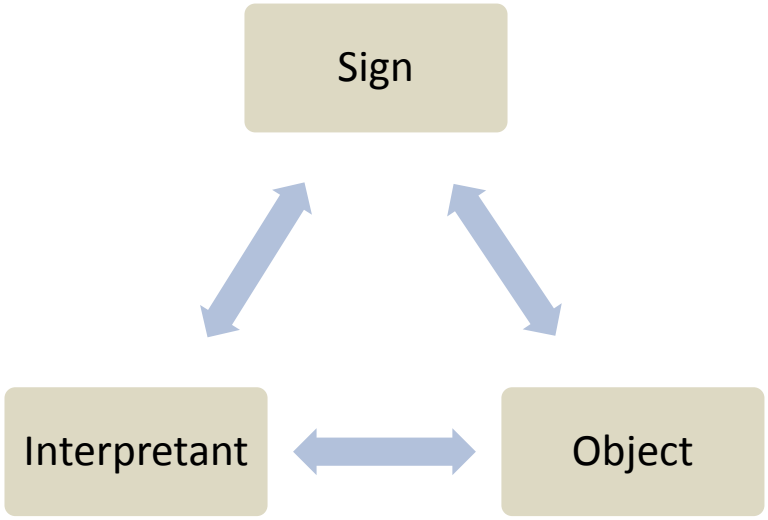


Figure 2. Peirce's Sign Model.

Note: Author's visual of Peirce's model, as described in Moriarty (2004).

Peirce also put forward his categorization of three types of signs that can be considered in a visual semiotic context; *iconic, indexical* and *symbolic. Iconic* signs resemble the things they represent. Indexical signs indicate associations with the signifier, concepts related to the sign. The classic example used is that of *smoke* being indexical of *fire.* The *symbolic* sign, a focus of this research described in this paper, is a visual that has come to represent some concept. A mascot for a sports team as well as graphic devices such as arrows and speech bubbles can be included in this category (Moriarty, 2004).

Table 2.1

Peirce's Three Types of Sign (based on Moriarty, 2004)

Type of sign	Definition	Example
Iconic	Looks like what it represents	A photo; an illustration; an object
Indexical	Indicates the existence of something	Smoke means fire; symptom means disease; a smile means happiness
Symbolic	Stands for something, conventionally understood	A flag for a country; a line through a circle for "no"

Social Semiotics

To describe factors that affect meaning, Jamieson (2007) encompasses Peirce's *interpretant* and considerations of cultural convention, and adds a third element referring to the creator of the sign. He describes visual communication in terms in "in-forming." He claims, "[there are] three levels of in-forming in visual communication a) at the level of the sender/image maker b) at the level of the receiver/viewer and c) at the level of convention, but social and cultural" (p. 55). Thus Jamieson adds the element of the image-maker as a factor in the formation of a sign.

The idea that a sign isn't a sign at all until someone gives it meaning leads us to a *social semiotic* view. In this view, contextual understanding cannot be taken for granted. Body language is a type of nonverbal communication that can be used for various

purposes, and is also a type of sign. Mohan (1988) describes gesture as coming in three varieties: *conducting* (to control participation - "stop," "come here"), *emblem* (take the place of words - holding one's nose to indicate a bad smell, folding two hands by one side of the head to indicate the word "sleep") and *illustrating* (used along with a verbal message to give emphasis). Mohan conducted a study on how preschoolers, both native and ELL, understand non-verbal gestures. The focus was on the decoding of emblem gestures. The study concluded that understanding varies with age and cultural familiarity. A newer subfield of semiotics, *visual social semiotics*, focuses on the interpretation of visual means of communication in all its forms (Harrison, 2003). Today those forms extend from physical gestures, ones that may have been in common use by prehistoric humans, to video and images seen and interacted with on computer screens.

Visual Communication

Although some past research contended that pictures actually interfere with literacy development (Samuels, 1970), one might be hard-pressed to find a language teacher who finds visuals useless. Britsch (2009) argues for the inclusion of visual literacy instruction in ESOL (English for Speakers of Other Languages) teacher training. She claims that even though most teacher training focuses on language, it is the visual that language learning is based on. In discussing how educators can learn from the example of video games, O'Brien and Bauer (2005) point out that it is the multimodal stimuli that reward users and keep them playing. The scaffolding and motivational factors that can be provided by pictures, video or interactive media outweigh any potential distractions from the reading objectives. In the book *Teaching Visual Literacy*,

McTaggart (2008) notes the benefits of using comics and graphic novels in K-12 curriculum. She cites the factor of greater comprehension by struggling readers as well as increased motivation for reluctant readers. Robert E. Horn, Stanford University's Center for the Study of Language and Information, agreed:

> When words and visual elements are closely entwined, we create something new and we augment our communal intelligence ... visual language has the potential for increasing ‘human bandwidth'—the capacity to take in, comprehend, and more efficiently synthesize large amounts of new information. (Ganwer, 2009, p. 5)

Learning Styles

Similarly, Gardner's theory of multiple intelligences has been referred to in educational research as it relates to how individuals learn. In reference to Gardner's work, Burmark (2002) points out, "Traditional educational practice has focused on three [intelligences]: linguistic, logical-mathematical, interpersonal" (p. 8). She continues by saying that most people learn better when additional intelligences are involved, the spatial/visual being one of them. It has been reported that 65 percent of all people are visual learners (30 percent auditory, 5 percent kinesthetic) (Ganwer, 2009). This gives credence to the notion that visual literacy is important and might even suggest that teachers should cater to the nearly two-thirds of students who learn visually, but there are contrary opinions. Paschler, McDaniel, Rohrer and Bjork (2008) claim that there has been no research to support attempts to cater to individual students' learning styles. The

paper cites research in which students were taught in their preferred style yet no better performance was found.

Whether or not there is such a thing as a visual learner, or an auditory learner, today many consider best teacher practices to include a number of modalities. Harper and de Jong (2004) counter this belief in the area of language instruction. They address, among what they believe to be common misconceptions about teaching ELLs, the idea that effective instruction means non-verbal support. They challenge the idea that pictures and diagrams will help comprehension of materials, on the grounds that even understanding those visuals may be culturally exclusive. The article explains that ELLs are often gaining both language and content skills, which include visual literacy. The pictures and diagrams may be just as foreign as the language, so visuals alone cannot reliably be used to instruct learners with varying educational and cultural backgrounds. Taking into account those diverse backgrounds, Gardner's multiple intelligences and multiple learning styles, Parrish (2004) describes a "multifaceted approach to teaching" (p. 26), that takes place in adult ESL education. Instructors incorporate multiple strategies and methods in order to accommodate for the diversity of the learners.

Among the many instructional methods teachers use, interactive technologies make use of new kinds of visuals. In 1976, before there was a computer screen in nearly every U.S. home and every pocket, Feldman predicted that our culture would be increasingly represented in visual terms. He contended that there was a language of images and that it could be learned; that it must be learned to thrive in this culture. In the book *Understanding comics: the invisible art*, McCloud (1994) suggests that visual

iconography offers a potential form of universal communication, but even that kind of communication must be learned. Fortunately, the language of images, just as spoken or written language, can be learned. Beginning ELLs need to learn the visual conventions of our culture as well as the language. The question remains as to which visual conventions are common across literacy backgrounds. The research described in this paper suggests some answers to that question.

Cross Cultural Visual Communication

As Feldman noted above, our culture relies heavily on visuals; visuals that include printed words. Stein (2000) notes that different cultures rely more heavily on other semiotic modes, like gestures or spoken words. They rely less on visual images: another reason to use multimodal pedagogies. The same information that may be passed on by way of a sign or TV commercial may be passed by word of mouth. But we can't claim that visual literacy is a competency only possessed by those who grew up in western society. Every sighted person learns by seeing. Where cultures may differ is in the types of visuals from which we are accustomed to gaining information. Linguist Daniel Everett (2008) describes his experience living in an Amazonian community. He says that villagers would see things in the environment, in some cases dangerous wildlife, that his eyes could not initially make out. These same villagers, when shown photographs, had a hard time understanding what they were supposed to be looking at. Photos were not part of their world. They needed to be taught how to make out two-dimensional images, just as Everett needed to be taught how to "see" in the Amazon. Indeed we might be named the equivalent of "visually illiterate" were we to try to navigate a culture that finds

meaning in other kinds of signs, one that has developed a different way of seeing. Zimmer and Zimmer's (1978) definition of visual literacy, "the ability to understand at a conscious level the visual language used within a particular culture or cultures" (p. 21), reflects the possibility of multiple visual literacies.

Every culture has its own visual literacy. Second and foreign language instruction always includes content in addition to the language itself. Language doesn't exist in a vacuum. Some of that content is visual in nature. Morain (1997) has stressed the importance of foreign language teachers also teaching cultural literacy, the "message-carrying potential of signs and symbols," and how meanings can change from culture to culture. In Peircian semiotic terms, as the interpretant changes, so does the sign. A common hand gesture in one culture may be obscene in another.

Visuals in International Development

The community of scholars working in international development have been responsible for a large part of the body of research on cross-cultural visual communication. They have reported on the many issues and miscommunications that can come up when one culture tries to visually communicate with another. When the work of international development workers is to promote health education, from our western point of view the way to do so has often been to print posters and brochures. When the target audience is a group with low literacy, or when written language needs to be avoided, pictures are used to communicate. But just as readers might not understand if the literature were written in English, the pictures themselves can cause confusion. Linney (1995) points out that people who live their lives without needing pictures have less

ability to interpret them than do those who regularly encounter pictures. One such example of a misunderstanding is told by Zimmer & Zimmer (1978). They describe a situation in which a film was used to show how mosquitoes carry disease. "It was full of close-ups of the insects, and people watching it decided, 'We do not have to worry. Our mosquitos are so much smaller!'" (p. 15).

The viewers of the film were not accustomed to the use of the close-up, misinterpreting what was being communicated and discounting important health information. The way we interpret a word, picture or artistic technique is based on our associations with it, and those always vary. If we bring vastly different associations to the same word or picture, we may misunderstand each other (Zimmer & Zimmer, 1978). This is very relevant to the field of international development, as many of the agencies, and often the creators of education materials, are from a culture different from that of the target audience. Cook (1980) states that special kinds of pictures should be developed for non-literate people. In the book *Pictures, People and Power,* Linney (1995) argues for the involvement of local populations in deciding how to relay information. One reason for this contention is to be able to avoid such problems of miscommunication. A similar argument can be made for the development of visual materials for domestic use. In developing visuals for communicating health information, Hill (2008) suggests collaboration with members of the intended audience and with staff who regularly work with the target population.

Cultures' Preferred Ways of Learning

In her research on picture perception and interpretation among preliterate adults, Hvitfeldt (1985) uses Bruner's 3 modes of information processing (enactive, iconic and symbolic) to suggest reasons why those from preliterate societies can misunderstand visuals. The *enactive mode* involves learning through direct experience, through physical means. The *iconic mode* makes use of the 5 senses and information is gained through observation and modeling. The *symbolic mode* is more abstract, making use of logic, language and mathematics. Hvitfedlt explains that traditional preliterate societies emphasize more enactive and iconic learning. Modern literate societies emphasize learning through the symbolic mode. Hvitfeldt's work has implications not only for those who are attempting to visually communicate abroad, but also to those who wish to communicate domestically with those who come from non-literate backgrounds.

DeCapua and Marshall (2010) have recognized that students with limited or interrupted formal education (SLIFE) often have views of learning that conflict with the methods commonly used in ESL instruction. SLIFE generally see value in learning for more immediately relevant, pragmatic situations, which contrasts with the norms of our culture. They also prefer working in groups and oral learning. In response, DeCapua and Marshall have designed a way to meet those students half-way. The Mutually Adaptive Learning Paradigm (MALP) is an instructional model that makes use of the more pragmatic, collectivistic and oral learning styles to transition SLIFE to more academic, individual and written tasks. A parallel can be drawn between DeCapua and Marshal's description of SLIFE and Hvidtfelt's description of those from pre-literate cultures. Both

groups are described as preferring learning through ways that are immediately relevant, through personal and interpersonal experience, rather than the more *symbolic*, academic learning preference that predominates in our educational culture. As MALP is used to transition SLIFE from their own views of learning toward the norms of our culture, perhaps the enactive and iconic visual modes can be used to teach the symbolic.

Artistic conventions. Literate cultures' use of the symbolic mode can be confusing to those from non-literate cultures. Walter J. Ong said that those from oral cultures learn to think in a different way: more concrete and situational (in Bigelow & Tarone, 2004). For this reason, some of the artistic conventions that are used in visual communication are not understood by those without literacy backgrounds. These conventions are symbolic in nature, not literal or *iconic*. Artistic conventions that have developed in western cultures but may not be commonplace elsewhere include graphic devices, vanishing point perspective, abstract drawings, silhouettes, shading and things depicted out of scale (as in the mosquito example above) (Schiffman, 1995). All of these artistic techniques can cause confusion. Another example of how abstraction can cause confusion or even horror is how a drawing of a single body part out of context can be considered confusing, gory or simply absurd (Hill, 2008; Schiffman, 1995; Zimmer & Zimmer, 1978). A perspective drawing of a cup in the foreground and another cup in the distant background may be seen not as one near cup and one far cup, but as one large cup and one very small cup, given that the distant cup is drawn very small to show distance. Language teachers who might use a perspective drawing like this to teach the concepts of "this cup" and "that cup" would not be able to rely on the 2-dimensional representation (Hvitfeldt, 1985).

Discourse Communities

In addition to the visual, all other types of communication between members of distinct cultures is potentially subject to misunderstanding. The factors that can cause misunderstanding can be discussed using the concept of *discourse*. Discourse can be described as a "way of being" in the world: saying and doing the appropriate types of things at the appropriate times for a situation at hand. James Gee (1989) describes discourse as an "identity kit" that comes with instructions on how to act and talk to take on a particular role that others will recognize. Along with other members, we form *discourse communities*. The term *discourse community*, differs from that of a *speech community*. According to Swales (1987), a speech community is variously defined as a group that shares linguistic rules, or language function rules, or even underlying value and belief systems. The language is what is used to hold the group together. Members of a *discourse community,* on the other hand, belong to a socio-rhetorical community that shares a common goal (Swales, 1990). For example, those who are pursuing a Masters degree in ESL, or who share the same workplace or hobby share the same objectives, and have their own language and ways of speaking, but they also have a limited scope of what is shared among them. A member of one group is also part of other discourse communities that have their own goals. Instead of language being for the purpose of socialization and solidarity, as in a speech community, it serves to facilitate the reaching of a common goal. Instead of holding a group together, a discourse community's language can actually serve to keep others from participating, as in the case of workplace-specific jargon or geographical region-specific vocabulary. The boundaries

between discourse communities can be drawn in any number of ways, between cultural groups or between groups with varied educational experiences. Though Swales (1987) is mostly concerned with written and spoken discourse, he says that a discourse community is "medium neutral," so must also include visual communication. Considering the theoretical frame of discourse, the present study explores how adult ELLs (both L1NL and LlL) interpret visuals from the American ELL education discourse community. Results may show that L1NL and LlL interpret visuals in the same way, as one discourse community, or perform differently, as separate discourse communities.

Research on Cross-cultural Interpretation of Symbols

There are many factors that can cause confusion to those who are not accustomed to visual language of another culture. Hortin (1981) claims that there is a grammar of visual language that includes sequence of pictures, angle of shot, color, framing, subject matter, form, space and timing. It's true that color may give unexpected connotations to an illustration. In China the color red is symbolic of good luck, whereas in America it can be used, both as a color of warning and the color of love on Valentines cards and flowers. As with colors, specific graphic devices have become symbolic signs that are generally understood by the visually literate within our literate culture; part of our visual lexicon. Cultural codes fix meaning to those signs (Moriarty, 2004). Those who are new to the culture, and who belong to a different discourse community, will need to learn these graphic conventions in order to understand what is being communicated. Some common graphic devices are those that are familiar to readers of comics in western cultures, such as speech and thought balloons. They are used to add a dynamic element to a static, two-

dimensional image. Someone who has never seen a thought balloon might not interpret the words contained therein as being unspoken thoughts of the character they are connected to, or that there is any connection at all between the two elements. According to Schiffman (1995), other symbols that might mistakenly be taken for granted as universally understood include crosses, arrows and checkmarks. She also notes that the skull and crossbones, understood in our culture from a history of pirate tales, has failed tests in other cultures. Also noted was the FDA focus group tests in which participants showed a slight preference for "X" over the circle with a line through it to show a prohibition.

A 2004 study focused on visual literacy, specifically the ability of 471 students to interpret 16 illustrations containing 16 graphic devices (Boling, Eccarius, Smith, & Frick, 2004). Some participants viewed the illustrations with the graphic devices removed while others viewed the pictures intact. Participants wrote short responses describing each illustration using their first language. Data was compared among five U.S. groups (third graders, sixth graders, tenth graders, college students and teachers of the deaf and hard of hearing) and one group of Malaysian college students. Responses were compared with the designer's intended meanings. Results showed that all groups' responses matched the meanings intended at a lower frequency than expected, but the Malaysian group had the fewest matched responses. This suggested that the culture, of both the designers of the visuals and of the participants doing the interpretation, was a factor.

A follow-up study was conducted which added a group of college students from Taiwan to compare with the data collected from the American and Malaysian college

students. The study showed similar results, with the American sample accurately interpreting a greater number of graphics than the other groups. Boling et al. (2007) draw a distinction between picture *perception* (what is in the picture) and *interpretation* (what it means). To interpret a picture, the viewer plays a large role not often considered. Indeed, the field of semiotics, according to Sless and Knowlton (as cited in Boling et al., 2007), focuses on the *sign* and what it stands for without proper consideration of the audience receiving the sign. As was mentioned earlier, in Peirce's model, the *sign* is the result of the interaction between the *object,* what is actually seen, and the *interpretant,* or what it means to the person doing the seeing. In the Boling et al. study, though the objects were the same, the interpretants from the Taiwanese and Malyasian perspectives were clearly different from those of the Americans. These results suggest that different meanings are constructed by viewers with different experiences.

The studies mentioned in this review have looked at culture as a factor in communication and visual communication. The Boling et al. (2007) data show that there is a difference in graphical device interpretation between participants with the same relative level of education (college students) but of different cultures. The study failed to include a participant group with no education; so no conclusions can be made about whether literacy was a factor. The authors do suggest that social and cultural backgrounds can influence what is seen in pictures, and most people would likely consider literacy to be another influencing factor in a person's background.

L1 Literacy and Visual Literacy

The visual literacy of L1NL participants is not a major area of study for second language education researchers, although some noteworthy studies have been performed. These studies give us some ideas of characteristics of these learners' visual literacy. Reis's (2006) study compared literate and illiterate participants' ability to identify photographs and drawings. All participants were found to be able to better identify objects when color information was added. The addition of color made more of a difference for the illiterate group, whose performance increased much more than did the literate group when viewing color photos and drawings. The author suggests that since the illiterate group lacked formal education, they hadn't had "the opportunity to systematically learn to practice and process two-dimensional representations" (p. 53). In addition, Reis includes the idea that regular reading and writing also improve visual skills through practice of pattern recognition and scanning visual representations. The life-experiences of the illiterate participants simply required them to read very few two-dimensional, black-and-white objects.

Recognizing that learning to "read" pictures is essential for the literacy classroom, Strube, van de Craats and van Hout (2009) focused their research on L1NLs and visual literacy. The research was a pre-post test design in which participants, most of whom were non-literate in their L1, described sequential picture stories using the L2, then did so again eight months later with no specifically targeted instruction between tests. Strube et al. focused on the *relevance* of the language used by participants in attempts to describe each picture and the *coherence* of the description within the context of each sequential

story. Among the observations made was that even though participants might have been able to name entities, it didn't mean that they were able to tell a coherent story. There were also cases of picture misinterpretation, lower-than expected gains between pre- and post-tests and a tendency for participants to include themselves as part of the picture descriptions—putting themselves into the stories. Regarding the use of pictures in literacy-level second language classrooms, the authors offer that, "New ways of information processing and conveying meaning are involved, which need to be learned in combination with and parallel to learning a new language and the principles of the alphabet" (p. 45). Strube et al. suggest a need for more such research on the multiple processes involved in becoming literate as an adult.

There are several possible reasons for difficulty in interpreting written and visual information: cultural background, cognitive style, stage of cognitive development and level of acculturation (Cooper, 2002). When teaching learners with both low literacy skills and low oral skills, communication via visuals can be greeted with a sigh of relief by both teacher and student. This has great use in communicating *iconic* signs representing things such as simple nouns or verbs. But *symbolic* signs can be culturally specific, and can relay more complicated information. Boling et al. (2004) state:

> Despite what appears to be a largely cross-cultural ability to recognize objects depicted in pictures, the visual content of an illustration is frequently a vehicle used to communicate a more complex meaning or intention. Beyond their ability to present a visual representation of a given object, visual illustrations do not

> constitute a universal language. The use of graphical devices (like arrows) to extend the meaning of illustrations adds complexity to the problem (p. 189).

L1 Literacy's Effect on the Process of L2 Acquisition

In Harper and de Jong's (2004) list of misconceptions about teaching ELLs, the ideas revolve around teachers' assumptions that all students, including ELLs learn the same way, and at the same rate. Scholars in the field of English Language Education give testimony to the contrary, especially when those ELLs have differing educational backgrounds. They point to a high probability that L1 literacy aides in L2 acquisition. For the "What Works Study for Adult ESL Literacy Students," Condelli and Wrigley (2003) studied 495 students in 13 ESL programs in order to determine best practices in teaching adult ELL populations. Among the findings, Condelli and Wrigley report that students with more home country schooling learned faster, at least initially, than their less educated peers. They report, "Since years of education may reflect students' native language literacy, this result seems to support the theory that students' literacy skills in their native language assist them in developing English literacy" (p. 121). Those literacy skills include the strategies learners employ in educational situations. Reimer's (2008) study of ELLs with little or no formal L1 education concludes that these learners do demonstrate some learning strategies that are useful in the classroom, but could benefit from instruction in other strategies. Exposure to formal education and development of L1 literacy may introduce other learning strategies in an L1 context, which could then transfer to learning an L2. A first language education alters the experience of learning an L2. Vinogradov (2008) asserts that L1 literacy transforms how a person thinks and

processes language. If that is the case, then the processing of visuals may also be affected by L1 literacy. To date, there has been little published research on whether L1 literacy also transforms how a person processes visuals. If there is a connection between L1 literacy and ability to acquire literacy in a second language, then L1 literacy might also influence the ability to gain visual literacy.

Conclusion

The need for research on ELLs with little or no L1 literacy has been noted by education scholars. The term *literacy,* though generally agreed to be defined as the ability to read and write, is still a term whose meaning is open for debate. Scholars agree that there is more to communication than the printed or spoken word. *Visual literacy* also shares the problems of definition. For the purpose of this study, visual literacy is a reflection of a social semiotic view of American cultural conventions of visuals used in conveying information, specifically the graphic devices commonly used. The literature supports the idea that L1 literacy affects L2 acquisition. The main purpose of this study is to determine how L1 literacy also affects visual literacy of the L2 culture.

In the following chapter, the methods of the current study are explained. Adult ESL learners, some with L1 literacy and some without, will be asked to interpret *symbolic* signs, which are visuals that have come to represent ideas that may not be intuited from seeing the sign alone. Each is a graphic device commonly used in our culture to convey some meaning in illustrations. The results will suggest how L1 literacy affects one aspect of visual literacy.

CHAPTER THREE: METHODOLOGY

This study aims to explore the impact L1 literacy has on visual literacy. How do learners with no L1 literacy interpret the graphic devices used in the L2 culture? How do their interpretations compare with those who have literacy backgrounds? How do L1NL learners and L1L learners experience the illustrations used in ESL texts? To learn more about the visual literacy of L1NL learners and L1L learners, a video recorded one-shot design was used to gauge how members of each group interpret graphic devices. Information was gathered using two methods: a demographic interview, an individual think-aloud session with verbal report prompts. The interview and think-aloud session was facilitated by an L1 interviewer. In this session, participants interpreted illustrations from an ESL text. Each illustration contained a common graphic device.

This chapter begins with an explanation of the research paradigm for this mixed-methods research conducted with the purpose of increasing knowledge of how L1 literate and L1 non-literate learners interpret graphic devices. The setting for the research, a description of the participants involved and a description of materials used to collect the data follows. Next, step-by-step descriptions are given of the procedures used to learn about participants' visual literacy as well as an account of the plan for data analysis. Potential ethical concerns are addressed.

Mixed-method Research Paradigm

A mixed-methods study allows for both experimental and interpretive data, assuring a more nuanced and thorough exploration of the research question. According to Mackey and Gass (2005), for a primarily quantitative study, the addition of qualitative data can "provide unique insights that would escape both the researcher and the reader if statistical counts and analysis were used in isolation" (p. 307). They add that, likewise, "qualitative reports can become clearer when some quantitative analysis is included" (p. 307). In the present research, the combination of multiple methods produces quantitative and qualitative data related to L1 education and visual literacy.

Quantitative research generally begins with a hypothesis for which data is collected using experimental means and some numerical analysis is carried out (Mackey & Gass, 2008). The Boling et al. (2004) study provides a good example of how quantitative methods can be used to measure visual literacy, and specifically, the interpretation of graphic devices. The hypothesis in Boling et al. was that different groups of participants would have varying levels of ability to interpret visuals. In this study a similar method is used to gather quantitative data, but instead of relying on written interpretation, oral means are used to allow for participants with low-literacy skills. The hypothesis in this study is that L1NL participants will perform differently from L1L participants. The number of accurately described visuals gives quantified data on the visual literacy of individual participants. The comparison of ability to identify the meanings intended provides measureable data. The data collected from the "think-alouds"

are picture narrations that will tell us whether the participant has certain graphic devices in her visual lexicon.

Where the quantitative methods (the demographic interview and picture description) gather information to answer specific questions, the qualitative means (verbal reports) provide richer information. Through these means a researcher may discover information that is not expected. The qualitative data gathered through these observations can be interpreted by the researcher to draw conclusions not specifically related to the hypothesis.

Verbal Protocols

This research relies heavily on qualitative data gathered from verbal reports. Verbal reports, also referred to as *verbal protocol*, *protocol analysis* or "think aloud" protocols, have been used by researchers of cognition to gather information about how people solve problems (Mackey & Gass, 2008). A participant does some task and describes what is going on in his mind as he does so. The researcher records the individual verbal reports and then tries to make sense of them (Pressley & Hilden, 2004). This method is of particular interest to those studying literacy. The majority of protocol analysis reading research focuses on talented readers (Afflerbach, 2002); better readers have better reading strategies and may be better at vocalizing the strategies they use. What is learned from how talented readers "think aloud" can be used to inform instruction of less-talented readers. But, according to Afflerbach, use of these methodologies with less-experienced readers can offer insight into how emergent readers, facing lack of learned conventions, use creative approaches to make meaning. They can

"help us understand the processes and strategies involved in reading" (p. 93). Verbal protocol methodologies are not standardized; they offer flexibility to fit the questions of the researcher (Pressley & Hilden, 2004). In the present study, methodologies commonly used to reveal how readers make meaning from text are adapted to gain information on how participants make meaning from non-text visuals.

In many "think alouds" participants are coached to give concurrent reports of what they are thinking while they are reading a text or solving a problem. In this study the verbal reports depended largely on verbal prompts from the L1 interviewer after the participant had seen the visual. Although participants gave concurrent verbal reports in reaction to the visual stimuli, verbal cues were also used to gain more specific data from participants. Pressley and Hilden (2004) report that low-ability readers are more likely to make it known when they don't understand if they are required to stop at intervals and report what they are thinking. Prompts by the L1 interviewer focused verbal reports on the visual element under examination. The prompts used by the L1 interviewer depended largely on how the participant responded to the visuals and to prior prompts. In this study, in addition to reporting verbally, participants were prompted to point to parts of the visual and demonstrate understanding through nonverbal gestures.

Observations

Researcher recorded observations made during interviews and in post-interview discussions with the L1 interviewer. Observations were also made from video recordings of interviews. All of these observations were of a *semi-structured* variety. *Highly structured observations* look for very specific, predetermined information to test

hypotheses. *Unstructured observations* are more hypothesis-generating, based on what is observed (Cohen, Manion, & Morrison, 2007). The semi-structured observation used in the current research looked for some specific information, how participants interpreted graphic devices, as well as more open observation of affective and behavioral reactions, time needed to verbally report and how participants responded verbally and nonverbally to visuals and interviewer prompts. This observational data enables researchers "to be open-ended and inductive, to see things that might otherwise be missed" (Cohen et al., 2007, p. 397). In the present research, observation provided for the collection of data beyond simply stating whether or not a participant understood a visual. This allowed a degree of unpredictability in the data collected and the potential for unexpected discoveries about characteristics, specifically, the visual literacy of the L1 literate and L1 non-literate.

Setting

The research took place at a large adult basic education program sponsored by a suburban public school district in the upper Midwest. Classes are predominantly in ESL and GED (General Educational Development), though there are also computer skills, basic math, citizenship, job skills and job-seeking skills courses offered throughout the year. Funding is provided through state and federal government sources. Classes are free to learners. During the 2010-2011 program year, 743 adults learners were enrolled at the ABE site at which this research took place.

In the ABE program, ESL students are assessed and placed in classes according to their reading scores on the CASAS. The CASAS tests measure reading competency in

life-skills content areas. Many questions in the lowest levels of the assessment involve illustrations.

Participant Sample

The research took place at the adult basic education site at which I teach ESL. The participants all attend beginning adult ESL classes at the same ABE program. A convenience sample of nine learners was used. Using an average of CASAS reading scores over the past year, each of the participating learners was categorized as a beginning or literacy level ELL. Beginning level is determined by a CASAS reading score of less than 201. Literacy level is determined by a CASAS score of less than 181. The previous year's averages attained by participants in this study ranged from 173 to 197.

The participants were chosen to provide a balance of those without L1 education, and who currently had no L1 literacy, and those who did have some first language literacy. Five L1NL learners and four L1L learners participated in the study. Initial information on years of L1 education was obtained from ABE program entry forms, but considering that those L1 educational experiences could vary widely, further assessment was needed. A person could report having attended five years of religious schooling, but that schooling might have been orally based. Another person may have never attended school but learned some literacy skills from a family member in the home. To avoid relying solely on self-reports of education, the Native Language Literacy Screening Device (NLLSD) was administered to learners, and participants were selected using these assessments. The Somali version of the NLLSD developed by Tarone, Bigelow and

Hansen (2009) was used [see Appendix A]. For the purposes of this study, participants with scores greater than three on the NLLSD are referred to as L1 literate, or L1L. Those with a zero score are referred to in this study as L1 non-literate, or L1NL. Of the participants in this study, L1NL participants had average CASAS reading scores ranging from 174 to 191. L1L participants had scores from 173 to 197. Of the four L1L learners participating in this study, two had only gained L1 literacy in recent years, as adults, and had no formal L1 literacy education. The other two L1L learners learned to read through formal education as children.

The study intended for the two sample groups to be as similar as possible, with the only major distinction being L1 education. To compare the visual literacy of L1NL participants and L1L participants, it is important to reduce the number of potentially confounding variables. Other background factors could impact visual literacy. A mixed group including L1NL participants and L1L participants from many countries would give results that may be due factors other than L1 literacy. One culture could be more accustomed to visual communication. Members of another culture might be more adept at describing things they see. For this study all participants were refugees from the same country, Somalia. All participants spoke the same first language, Somali. All participants were female. The sample's composition of participants from similar geographical and cultural backgrounds mitigates the effect of cultural influence on results.

Age of participants was determined by the dates of birth reported on ABE program entry forms. The ages of participants ranged from 23 to 58. An effort was made

to include a balanced representation of ages in both groups. LlNL ages ranged from 23 to 58. L1L ages ranged from 27 to 43.

Materials

Twelve images, plus two example images, were selected for use in this study. Each image contained a commonly used graphic device. Some of the devices were used more than once as they have multiple uses. The arrows, in this collection of images, were used to indicate future movement, show line of sight, show body movement, or draw attention to an important element in an image. Different shapes of balloons or bubbles were used to indicate speech, thought, magnification and group singing.

All of the images under investigation were enlarged versions of black and white illustrations from *Step forward: Introductory level* (Santamaria & Adelson-Goldstein, 2007), one of the life-skills focused books used in ABE programs. Some of the images may have been seen previously by participants. In some cases the images were edited to better suit the purposes of this study. Each image contained one or more *iconic* signs, usually a depiction of a person, and a *symbolic* sign, a graphic device used to convey some meaning in the ESL text. In most of the illustrations all but one or two of the *iconic* signs were removed by the researcher. One reason for this was to encourage viewers to attend to the elements under focus in this study. Removal of these *iconic* elements also prevented participants from using contextual clues to find meaning, rather than using the graphic device. Except for the digits on the clock, all alphanumeric print were removed from the illustrations. As above, this was in the interest of context removal. It was also

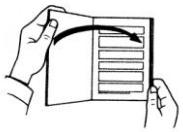
hoped that the erasing of text would keep participants from being distracted by trying to read letters and words.

The graphic devices contained in the images were assumed to be symbols commonly understood by North Americans. To verify that assumption, a sample of North Americans was asked to explain the pictures and the functions of the devices. Recognizing that the researcher might be biased by familiarity with ESL materials and the typical visuals used therein, outside confirmation was sought from a convenience sample of three North American non-teachers. Based on the responses given by the North American natives, the images were confirmed as being easily understood. Responses given were added to the list of words expected to be used to describe the visuals. The graphic devices used in this study and the meanings intended by their use in the *Step Forward* (Santamaria & Adelson-Goldstein, 2007) series are the following:

Images and their Intended Interpretations

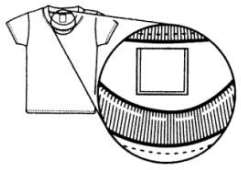
1.Bubble indicates speech. 

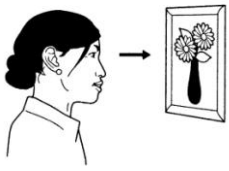
2. Lightning bolts symbolize pain. 

3. Arrow shows future movement left to right (close book). 

4. Bubble indicates unspoken thoughts. 

5. Arrow shows body movement (stand up). 

6. Larger image shows magnification. 

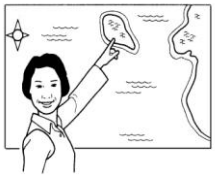
7. Arrow shows line of sight. 

8. Shading and arrow show passage of one hour. 

9. Arrow is used to draw attention to important part (corner). 

10. Bubble is used to magnify/explain (shopping list). 

11. Bubble with musical notes indicate singing together. 

12. Compass rose indicates that image is a map. 

These images were arranged, one per page, in a three-ring binder. The images were arranged in an order predicted to increase in difficulty of interpretation. The order of images purposefully did not include any consecutive uses of the arrow or similar bubbles to help avoid any confusing influence they might have had.

Procedure

In the weeks prior to the experiment, some class lessons included think-aloud type activities involving the description of visuals. This was intended to familiarize participants with the procedures that were involved in the study. Thus, on the day of the experiment the instructions would not be confusing and participants could focus on interpreting the visuals. As a result, if participants were unable to perform the tasks, it suggested a lack of understanding of the visual, not of the directions for the think-aloud. Care was taken that the activities in the weeks leading up to the experiment did not include any of the graphic devices used in the experiment. The researcher kept a teaching journal of observations made during these think-aloud classroom activities and during any other lessons that made use of illustrations. Observations made note of learner

reactions to visuals that were not under focus in this study. Observations recorded in the teaching journal were expected to prepare the researcher for the types of responses that would come from participants. Some of these observations are described in chapter four.

Students were pulled individually from classes during their regular schedules to participate in the data collection. Efforts were made to conduct the sessions in as few days as possible or on a single day to avoid any influence of talk between participants.

Role of L1 Interviewer

The demographic interview and think-aloud session depended on the assistance of a Somali native speaker. This L1 interviewer was trained in the research methodology by the researcher. Together, the L1 interviewer and researcher assessed the procedures used in a pilot data collection and made some adjustments to the methods.

During data collection the L1 interviewer asked demographic interview questions as scripted and asked for additional information when responses required clarification. In the think-aloud sessions, the L1 interviewer used the prescribed verbal prompts to elicit responses and immediately interpreted into English what the participant said. This allowed the researcher to assess the participant's understanding and direct further prompts, which the L1 interviewer then phrased in Somali. Much of the data collected in this research is dependent upon the interpretations of the L1 interviewer. Her cultural insights also informed analysis of the data.

Pilot Study

A pilot data collection session was conducted with one pilot participant in the week prior to data collection. A number of changes were made as a result of problems

that were observed. Other changes happened organically and were implemented for the study. One important change that happened without consciously choosing it had to do with the timing of interpretation. In the original plan, it was thought that real-time interpretation would not be easy. Interpreting would have been done after each session. This might have led to a loss of data and too much recording responsibility given to the L1 interviewer, who would also be interpreting. During the pilot, the L1 interviewer began interpreting each response as it was given. This way the researcher could be responsible for taking notes on responses and the L1 interviewer could focus on interviewing and interpreting. This also allowed for the researcher to understand the responses in real-time and direct follow-up questions accordingly.

Another major change that came from the pilot data collection was the determination to not reveal to the participant the intended interpretations of the images. It was originally thought that additional data could be gained from participants' responses to learning the "right" answers. In the pilot, this was done for some of the early images. The unintended result of this was that the pilot participant used information gained earlier in the session to answer later questions. This was discovered in one of the later follow-up questions asking how the participant knew the answer. She responded that it was logical, since the symbol explained earlier looked a lot like the one in the current image. It was determined that early explanations overly influenced participant understanding of later images. Although participants expressed desire to know, data collection procedure in this study did not include the revealing of the intended meanings of images.

Some data collection materials were changed as a result of problems observed in the pilot. It was discovered that the image of a man with a headache had been seen in class the previous month. The image was replaced by a similar one of a woman with a headache. Another problem was that the pilot participant experienced some confusion due to image outlines on subsequent pages showing through the non-opaque paper. This was remedied by making each page two pages thick, contained within a plastic sheet protector.

Demographic Interview

Each individual session began with the oral demographic interview. Since reading ability varied among participants, the demographic information was gathered orally. To be sure to gain accurate information, the interview was conducted in Somali by an L1 interviewer. Participants answered in any combination of English or Somali. Answers were recorded by L1 interviewer using data collection tool #1 [Appendix B].

This portion of the interview contained both quantitative and qualitative elements. It was used to gain background information which might later be looked at alongside the visual literacy components of the interview. The questions were all yes/no, or could be answered with a number of years and/or months, but allowed for follow-up questions if answers were in the affirmative. For example, if a participant responded that she could read in a language other than English, L1 interviewer asked which language(s) and asked for details on what it was that the participant read and how often. If a participant responded that she had attended school in Africa, L1 interviewer asked for details about that experience: what kind of school, how regular the classes were, and whether reading

and writing were involved. The questions elicited information on L1 literacy, L1 and L2 education, years in America and work experience. The researcher, who might not have understood the responses (being mostly in L1), operated video recording equipment and observed the session, making notes of affective responses. L1 Interviewer and researcher discussed recorded responses after each session.

"Think-aloud" Session

In the second part of the interview, the participant responded to illustrations that came from an ESL introductory text. Each illustration contained *iconic* signs, ones that look like the things they represent, as well as a graphic device. An iconic sign typical in the visuals used in this study was a representation of a person. Another iconic sign was a drawing of a chair near the person. A graphic device, such as an arrow pointing upward from the chair toward the person, was used to indicate movement away from the chair, or standing up. A graphic device, such as an arrow, is *symbolic* in nature, i.e. is not a literal representation of a physical entity. These devices have come to have certain meanings in our culture, meanings that may not be universally understood. The list of graphic devices chosen for the study along with their functions are included in Appendix C.

The second part of the interview was a kind of think-aloud session. In a true think-aloud session, a participant does some task and describes what is going on in her mind as she does so. As described by Mackey and Gass (2008), this way a researcher can gather information about how people solve problems. For this study articulation of the thought process was not in focus. This think-aloud was more of a picture narration that would tell us whether the participant has certain graphic devices in her visual lexicon.

The participant was shown 12 illustrations, one at a time. The L1 interviewer asked the participant to interpret each illustration, using the interviewer checklist [see Appendix D] to make note of responses. Verbal prompts were used to elicit responses and L1 interviewer gave English interpretations of L1 responses. Based on these interpreted responses, the researcher guided follow-up questions. Whether or not the participant correctly identified the meaning of the graphic device, the L1 interviewer used follow-up questions to gain more information about what the participant saw in the picture, how she made meaning from the illustrations. Responses to these prompts provided qualitative data beyond simply determining whether a participant understood an illustration. They provided some insight into why she did or didn't understand. Follow-up questions also helped clarify what was understood, and how participants came to have these understandings. Observation notes [see Appendix E] were taken by the researcher to record responses and anything that was not predicted by the data collection tool. Together with the oral survey, this interview session took 20-25 minutes per individual.

Upon completion of the session, the L1 interviewer and the researcher became co-raters, and immediately discussed each participant response. Notes were compared and determinations were made as to how accurately a participant interpreted each image. Co-raters discussed how each participant responded. Each response was coded as *yes*, *no*, or *incomplete*. *Incomplete* was recorded if a partial response was given or if there was a difference in opinion between co-raters as to whether the participant accurately interpreted the graphic devices. L1 interviewer also provided cultural insight as to why a participant may have described an image a particular way.

A video camera was situated so that the images being discussed and both the participant and L1 interviewer were visible. This made it easier to identify what was said and by whom and to make note of gestures and body language. The post-interview co-rater discussion was also recorded. Videos were reviewed at a later date to confirm responses and to conduct further analysis.

Before the 12 pictures were addressed, the L1 interviewer showed two practice pictures. For the first practice picture, the L1 interviewer modeled how to describe the illustration using think-aloud protocols, naming and pointing to *the iconic signs*, the *symbolic sign* and describing the relationship between them. For the second practice picture, the participant did the same, the L1 interviewer providing help if needed. For each of the 12 pictures, the participant did the same, but without help. The think-aloud session for each illustration had two parts, think-aloud part A: a quick determination of whether the participant understands how the graphic device is being used, and think-aloud part B: the follow-up prompts to gain more qualitative information [see figure 3].

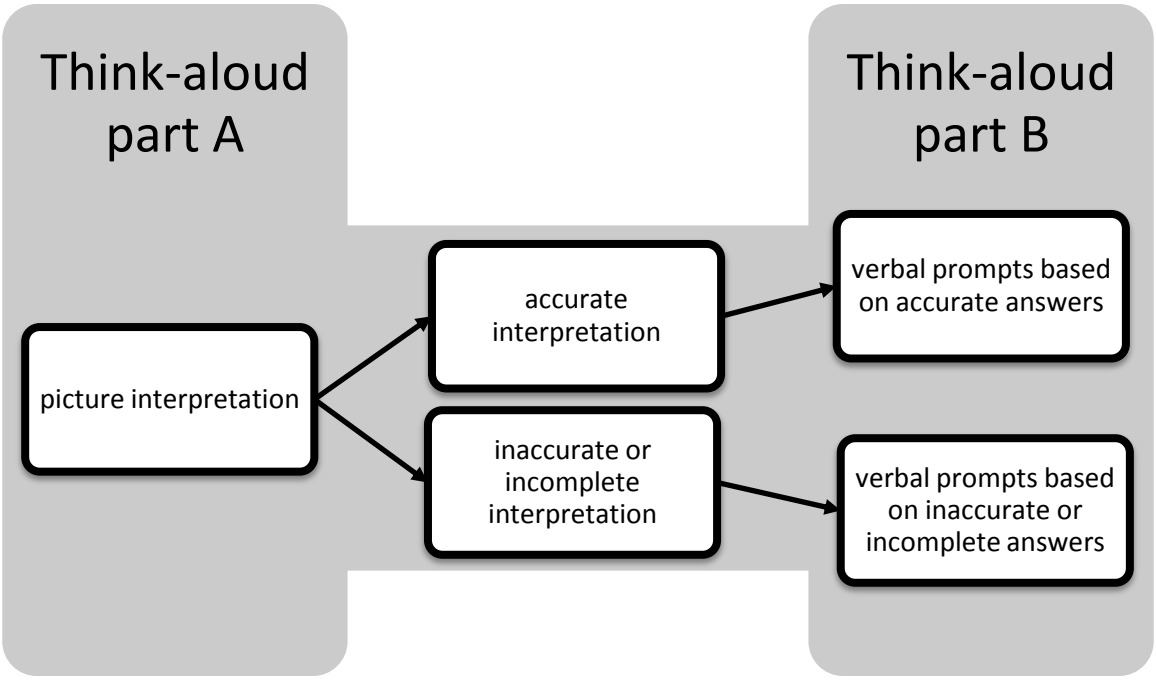


Figure 3. Diagram of think-aloud verbal protocol.

During think-aloud part A, the more quantitative portion, the L1 interviewer provided no help but would neutrally repeat what the participant said and ask questions to elicit further response such as, "What do you see here?" and, "Anything else?" Image #5, the picture of a man getting up from a chair produced the following interaction with one participant (transcribed from Somali interpretation):

L1 interviewer: *What do you see in this picture?*

Participant: *I see a man*.

L1 interviewer: *A man. What else?*

Participant: *A man who's trying to get up from a chair*.

Using data collection tool #1, L1 interviewer and researcher made note of any bodily gestures that could also have indicated an interpretation of the drawing.

Researcher used separate copies of each illustration to make notes about what participants said, the places they pointed to and any other observations [see Appendix E].

To the participant, the transition from part A to part B was to be unnoticeable. Part B consisted of follow-up questions and prompts to expand upon the responses in part A. Which specific questions were asked depended on the responses given. If the participant was able to accurately describe the illustration in part A, including the function of the graphic device, one set of follow-up questions was used. These questions asked about how she knew the answers, whether it was easy to understand, if she had seen pictures like this before and where, and asked her to point to the clues she had used to determine the meaning. Follow-up questions were used to determine whether the graphic device itself was the clue that led to the interpretation or if there were other elements in play that led to the accurate interpretation. If the participant was not able to accurately and fully describe the illustration, she was asked to describe why she had given an alternate response, and what had made her give that answer. L1 interviewer could point to the graphic device and ask the participant what she thought it was or what it meant and if she had seen anything like it before and where. L1 interviewer did not reveal the intended interpretation so as not to influence interpretation of other images. This process was repeated for each of the 12 pictures. Part B of the think-aloud session, continuing with the above accurate interpretation transpired like this:

L1 interviewer: *How do you know that?*

Participant: *I can see he's trying to get up because the arrow is up, and he's trying to get up at the same time. That's how I can tell.*

L1 interviewer: *Have you seen an arrow like that some place before?*

Participant: *I've seen an arrow before, and obviously I've seen someone get up, but I've never seen them together before*.

Part B of a think-aloud session in which a participant did not accurately interpret the graphic device in the same image transpired as described below. This participant was not able to identify the arrow as an indicator of upward movement.

Participant: *It looks like someone who is handicapped. He has back pain.*

L1 interviewer: *Is he doing anything?*

Participant: *He trying to sit up or get down. I'm not sure which one.*

L1 interviewer: *But he's moving some way, right?*

Participant: *Yes, he's either getting up or sitting down.*

L1 interviewer: *How do you know that?*

Participant: *Don't you see that he's trying to hold both sides? It tells you that he's getting up or sitting down. That's normally how somebody uses it when they're trying both.*

L1 interviewer facilitated the session in Somali. The participant was encouraged to respond in either Somali or English, since the goal of the study was to determine whether the participant understood the drawings, not whether she could respond to them in any particular language. Participants were allowed to use either Somali or English in the think-aloud in order to prevent inadequate L2 vocabulary from inaccurately reflecting a lack of understanding. Understanding of the visuals was transmitted via oral interpretation and gesturing.

Immediately after each session, L1 interviewer and researcher discussed and compared notes on the interview. Data collection tools were compared and L1 interviewer again translated into English the responses given.

Verification of Data

The combination of multiple data collection methods can produce interesting data. Straight background data and the think-aloud session provided quantitative data comparing the individuals but mostly comparing the L1NL and L1L groups. Images were presented in the same order each time, and questions were as similar as possible for each one. The verbal prompts used in the think-aloud provided qualitative data on how participants interacted with the visuals. From this directed, but open-ended discussion of the visual materials, some unexpected data was expected to be uncovered about how these two groups of Somali-Americans differ or were the same in their ability to interpret common graphic devices.

Data Analysis

L1 interviewer and researcher became co-raters immediately after each session. The use of co-raters helps establish inter-rater reliability, one manner of ensuring the validity of quantitative or qualitative research (Cohen, 2007). A single rater is capable of overlooking something or making mistakes, but that capability is reduced when another rater views and rates the data independently. The video recording was used as backup for anything not caught during the session. Answers from think-aloud part A were coded. Co-raters used the pre-generated list of expected words that, if used by a participant, might have indicated comprehension of the graphic device (see data collection tool #2,

Appendix D). L1 interviewer circled any of the listed words used by the participant or wrote any other unanticipated words or gestures that also indicated understanding. Responses were coded as accurate if a word from the list was circled and if other words or gestures that indicated understanding were recorded by either the L1 interviewer or the researcher. For each answer marked as accurate, a "yes" was recorded for that participant for that image. If multiple contradictory answers were offered, for example if the participant offered both *stand up* and *sit down* in the course of describing the picture, raters judge whether one or the other was settled upon as a final answer and was scored accordingly. When raters didn't agree or when partial understanding was indicated, an "incomplete" was recorded. If a participant did not indicate understanding of a graphic device, a "no" was recorded. The discussion of rating was video recorded for future review and data verification.

Review of responses to think-aloud part B took place concurrently with that of part A. L1 interviewer interpreted the oral responses of participants and compared observations with researcher. These interpretation sessions and the video recordings thereof were analyzed for the gathering of qualitative data on participant responses. Data was analyzed with reference to participants' demographic information, especially with L1 literacy. Chapter four details the results of the data collection.

Ethics

Before beginning each session, the L1 interviewer explained the purpose of the interview and interpreted the consent form for the participant. The form [see Appendix F] indicated that participation was voluntary and that the participant could choose to stop at

any time if she wished. The participant was assured that her participation was anonymous. L1 interviewer and researcher asked the participant to sign both copies, and to keep one for herself.

Each participant was assigned a pseudonym to protect anonymity. Data collected is associated only with the participant pseudonym, not with the actual name. Other than during the interview, the researcher maintained sole possession of the data collected. Video recordings of the interview sessions are destroyed upon completion of the capstone project. Notes and other data collection tools are also destroyed upon completion of the capstone project, with the exception of those included in the appendices. Any potentially identifying participant information was omitted from any data collection tools included in the appendices.

CHAPTER FOUR: RESULTS

This study took place on four separate dates over the course of two weeks. On each date, between one and four participants, beginning ELLs of varying L1 literacy, were individually pulled from their adult ESL class for a 20-30 minute interview. Each interview consisted of a short demographic survey and a think-aloud session in which participants described what they saw in 12 individual pictures. The pictures were modified versions of illustrations used in adult ESL materials, each containing at least one graphic device. The participants were prompted to describe each illustration. To follow up on each response, participants were asked about their reasons for answering the way they did and their experiences with the graphic devices used. These discussions were recorded for analysis. Through the collection of these data, this research sought to find out how L1 literacy affects visual literacy.

This chapter contains a description of the data that was collected for analysis. First, the demographic information collected from participants is presented. Next, the results of the think-aloud sessions are given. These results are first shown in terms of participants' relative abilities to accurately interpret each graphic device. These results are then shown alongside the information on the L1 literacy backgrounds of participants. The bulk of this chapter is a richer description of the ways participants responded. A summary of responses to each individual illustration is provided.

In planning lessons in the weeks prior to data collection, I wanted learners to have practice describing pictures, but I didn't want the pictures to contain the graphic devices being studied. I found it hard to find picture stories that fit in with my current thematic unit that did not make use of the graphic devices being studied. The picture stories I did use contained other graphic devices not included in this study. I observed some misinterpretations of those devices, for example a wet umbrella being shaken up and down is drawn so that some learners saw it as a person holding two umbrellas. I also observed that wavy lines used to indicate a smell were interpreted as rain. In one picture story, a line through a comic panel was used to indicate two actions occurring at once. As an experiment, I asked the class what the line might have meant. When no one came up with an idea, I explained that this line could be used to show two things happening at the same time. I heard a few "aha" sounds from the group, an indication that this interpretation hadn't occurred to the learners before. These observations gave me a taste of what I was to learn from my data collection.

Demographic Interview

The demographic interview relied on self-reports by participants and accuracy isn't guaranteed. In the case of self-reports of literacy versus what was learned from the Native Language Literacy Screening Device (NLLSD), some comparisons can be made. Otherwise, participant information is recorded as given. All names used are pseudonyms.

The NLLSD indicated that four of the nine participants were able to demonstrate literacy in Somali, but six of nine self-reported the ability to read at least "a little" in L1. That means that two participants reported the ability to read "a little" in L1 even though

NLLSD indicated no literacy. The same two participants reported having studied a year or less in L1. For this study, the results given by the NLLSD, not the self reports, were used to determine who is L1L or L1NL. Data on literacy, education, time in the United States and work experience is shown below in Table 4.1.

Table 4.1

Participants' educational background information.

Name	Age	CASAS	L1 literacy	Read L1 (self-report)	School in Africa	Time in US	School in U.S.
Khadra	36	197	yes	some	7 years	8 years	1 year 2 months
Deka	31	195	yes	a little	0	9 years	2 years
Farhiya	43	189	yes	a little	0	4 years	2 years
Asha	27	173	yes	yes	2 years	5 years	3 months
Hani	58	191	no	a little	1 years	3 years	3 years
Ebyan	49	181	no	no	0	4 years	3 years
Basro	50	176	no	a little	1 years	5 years 4 months	2 years
Ifrah	49	175	no	no	0	5 years	8 months
Geni	23	174	no	no	0	4 years	1 year

Five participants reported no L1 education. Of those five, two have gained L1 literacy as adults. Length of time in the U.S. ranged from three years to eight years. Time in ESL classes in the U.S. ranged from three months to three years. Six of nine have had jobs in the U.S. but only one reported using some English in that (volunteer) job.

Image Interpretation

The results for the interpretation of images are divided into two parts. The first part is shown as quantitative data on whether participants accurately interpreted the graphic devices in each image. The second part is qualitative data, providing deeper descriptions of participant interpretations. This data is provided in summary form as well as through the inclusion of noteworthy individual think-aloud session responses.

In reviewing participants' responses in order to compile quantitative data, it quickly became clear to raters that judging whether a participant accurately interpreted a graphic device was not as straightforward as had been hoped. There was more to be recorded than a simple determination of *yes* or *no* was able to describe. Many participants were not able to interpret the images, but some came closer than others and that fact is worthy of note. Therefore a third rating of *incomplete* was scored when a participant had responded with partially correct answers. Raters also used *incomplete* when, upon review, there remained some doubt about the participant's interpretation, but still leaned towards *yes.* Details on *incomplete* responses and all other responses are summarized in the more qualitative summary section. Many participants gave multiple answers. The one deemed to be either the initial response or the one finally settled upon was recorded for *yes/no/incomplete* portion.

Of the 12 images presented to participants [see Appendix C], only four images were judged to have been fully and accurately interpreted. For the majority of the images, participants had little trouble describing the non-symbolic elements, but the symbolic graphic devices made interpretations of the images problematic. No participant was able

to accurately interpret images #3, #4, #6, #8, #9, #10, #11 and #12 as intended by the publishers of the materials from which they came. No participant had even a partially correct interpretation of the graphic device used in image #6. All other images had at least one accurate or partially accurate interpretation by a participant. Table 4.2 shows participants' accuracy of interpretation for each graphic device.

Table 4.2

Participants' interpretation accuracy

image name	1	2	3	4	5	6	7	8	9	10	11	12
Khadra	no	inc.	no	no	yes	no	yes	no	yes	no	no	no
Deka	no	yes	no	no	yes	no	yes	no	yes	no	no	no
Farhiya	yes	yes	no	no	no	no	yes	no	yes	no	no	inc.
Asha	no	yes	no	no	no	no	yes	no	yes	no	no	no
Hani	no	yes	no	no	no	no	yes	no	yes	no	inc.	no
Ebyan	no	no	no	no	inc.	no	no	inc.	no	no	no	no
Basro	yes	yes	inc.	no	no	no	yes	no	yes	inc.	inc.	no
Ifrah	yes	inc.	no	no	no	no	yes	no	yes	no	inc.	inc.
Geni	no	no	no	inc.	inc.	no	yes	no	yes	no	no	no

Note:

yes = participant interpretation of graphic device matched meaning intended

no = participant interpretation of graphic device did not match meaning intended

inc.= participant's interpretation was deemed incomplete or partially accurate

No participant was able to accurately interpret more than three images. The participant who performed best accurately described the function of the graphic device in three images and had partial accuracy in three more images. Each of the nine participants rated at least two partially correct or two correct. A summary of results is shown in table 4.3 below.

Table 4.3

L1 literacy and number of images accurately interpreted - as ranked by number of accurate interpretations

Name	L1 literacy	**yes**	incomplete	no
Basro	L1NL	**3**	3	6
Farhiya	L1L	**3**	1	8
Deka	L1L	**3**		9
Ifrah	L1NL	**2**	3	7
Khadra	L1L	**2**	1	9
Hani	L1NL	**2**	1	9
Asha	L1L	**2**		10
Geni	L1NL	**1**	2	9
Ebyan	L1NL	**0**	2	10

note:

L1NL = First language non-literate

L1L = First language literate

Graphic Device Interpretation and L1 Literacy

In the interpretation of graphic devices, there was a wide range of visual literacy among the L1 non-literate. Both the participants with the greatest and the fewest number correct were L1NL. Basro, the participant who was able to successfully interpret the greatest number of graphic devices, had less than a year of L1 education 40 years ago, and currently has no L1 literacy. The two participants with the greatest number of graphic

devices correctly or partially interpreted, Basro and Ifrah, were both L1NL. The participant that didn't successfully interpret any graphic device was also L1NL. L1L scores did not vary as widely as L1NL scores.

Think-aloud Summaries

As participants interpreted the images one-by-one, the researcher (via L1 interviewer) asked follow-up questions drawing attention to elements of the picture. Participants were also asked questions about what made them answer a particular way or where they had seen similar images before. When a participant indicated that she didn't understand the illustration or an element thereof, the L1 interviewer prompted her to make a guess. These elicitations were made with the intention of obtaining richer data than might have been obtained from simple answers.

In this section, descriptions are given of participant responses in the think-aloud portion of the interviews. Special attention is paid to the symbolic and non-symbolic elements named. Summaries of L1L vs. L1NL interpretations are offered when differences between levels of mastery are noteworthy. Descriptions are given of similarities and patterns among responses as well as noteworthy individual responses. This section is organized by description of the responses given by all participants for each individual image. Rather than presenting the information in the order that participants experienced the images, the images are grouped here by the types of graphic devices used. The three categories of graphic devices are *bubbles*, *arrows* and uncategorizable *other graphic devices*.

Bubbles as Graphic Devices

Images #1, #3, # 10, #11 make use of bubbles (also called balloons) to convey different ideas. Image #1 shows a speech bubble, #3 a thought bubble, # 10 a bubble magnifying or explaining another element, and #11 a speech bubble with multiple stems to indicate group speech with musical notes contained within to indicate that the group speech is singing.

#1

All participants identified the woman in image #1. Two participants made note of her smile. Three participants, one L1L, two L1NL, correctly identified the graphic device as an indication of talking. Basro said that she had originally learned the sign when she was a child, looking at the comics section of her father's newspaper in Somalia. Ifrah said that she had seen the sign used in children's books here in America. Basro and Farhiya said that they had seen this sign used in ESL class materials. Participants who gave other interpretations of the speech bubble said it looked like a pen, someone looking in a mirror, a (white or black) board, or a sign pointing to something.

#4

All participants identified the picture, by using words or by physically mimicking the image, as showing a person with her hand to her mouth. Six participants identified the woman as experiencing an emotion of shock or fear. Using only the non-symbolic elements, participants also mentioned that she got hurt, that there was something unexpected, she was yelling, there was something missing, she had a toothache or that she was singing.

None of the participants described the bubble as meaning *thought*. Ifrah, who has low first-language literacy, and who learned the speech bubble from children's books, also identified this sign as indicating either *talking* or *screaming*. About the bubble she said, "Definitely words go there." Geni came closest to accurately interpreting the thought bubble saying that the sign was the woman's brain. Upon further questioning on whether the bubble indicated her actual brain or the thoughts contained therein, it was determined that she saw the bubble as her actual brain, perhaps magnified. About the bubble we asked, "What is in there?" Geni responded that nothing was in there but air and, "I get scared sometimes too when I'm alone and someone knocks on the door and I'm not sure." As she represented the closest to accurate interpretation, and it is possible that she understood the sign but was unable to articulate it, her answer was scored as *incomplete*.

Most of the other participants ventured guesses about the meaning of the symbolic sign. One participant said the sign represented objects about to hit the woman's head and the cause of the pain indicated by her face. Similarly, another indentified a rain cloud coming, with the smaller circles as drops of rain coming toward the woman's head. Two

participants described an unnamed *something* that is scaring her unexpectedly or that she is trying to stay away from. The participant who thought that the woman had a toothache said that the bubble was a sign that means *pain.* Basro said that the sign was air coming out of the woman. She identified a starting point for the bubble sign and said that since it starts small and gets bigger, it must coming out of her, not going in.

#10

All participants identified the picture as showing a person shopping. Five participants identified the object in the man's hand as being paper related to shopping, either a shopping list (4) or a receipt (1). Three participants indicated that the man had some kind of card in his hand; two of those said that it was an access card for a door.

None of the participants was able to identify the bubble as being a sign that magnified or explained the object in the man's hand. The closest answer was that of Basro, who identified that the man was reading from the object in his hand. As in image #1, she saw the bubble as coming from the man's mouth, and therefore was reading aloud, which is not the case in this image. Five participants suggested that the bubble could be a doorway, entrance or exit. Two mentioned that it could be related to scanning the card in his hand, to get in the door to scan a barcode. Other answers that came up were cashier checkout, a camera, a sign or something the man is walking by. Beyond

saying that it was a man with a paper shopping list in his hand, Ebyan would make no further guess.

#11

All participants identified the picture as showing a number of people. Five participants said that the group was a family; two said they could be a teacher and students. Based only on the iconic elements, that is the people, how they are situated, the expressions on their faces, the participants came up with a number of ideas as to what the people are doing in this image. Answers included watching something, taking a picture together, talking, laughing, meeting and screaming. Ifrah mentioned that they were facing the same way, like a choir.

No participant was able to identify both the musical notes and the bubble as group oral production. Two participants, both L1NLs, came very close. Ifrah said that it was like they are talking or screaming together and she even mentioned the word *song*, but when she was asked what the bubble was, she said it was a board that has what they are saying. When asked to explain the musical notes, she had no guesses. Basro also came very close. She identified the bubble as speech coming from the group, but she mentioned that not all of them were talking since there were only five stems (not her term) on the bubble and seven people in the image. When asked about the musical notes in the bubble,

she said that the group could be listening to music. Thus, Basro identified the bubble as a group speech, and the notes as music, yet failed to put them together to mean group singing. Ifrah, on the other hand, was able to use the symbolic speech bubble and other non-symbolic elements to mostly identify the overall meaning of the image without using the musical notes.

Hani was another participant who was able to understand one element, the speech bubble. She said that it was, "what they are screaming from their mouths." This is noteworthy because she did not identify the speech bubble in image #1. It is possible that she used the greater context of image #11 as a clue that was not present in image #1.

Geni used an interpretation similar to that of a thought bubble. She said, "Each person's idea is in [the bubble]," and that they are, "using their brains." This sounds similar to her interpretation of the thought bubble in image #4, but improves upon it by noting that people's ideas are contained within the bubble. She made no guess at the meaning of the musical notes.

Deka said that something was behind the people. Ebyan thought the bubble was something that's recording something. Although Asha thought that the bubble resembled a "creepy-crawly" in shape, she thought it might be, "a place to enter to watch a movie or something."

Many participants interpreted the musical notes as individual items, not as a related group of symbols. Taken as individual drawings, they saw a bird, a squirrel, glasses, earphones and little animals. Hani said they were like numbers. Farhiya thought the lower notes were numbers but that the one on top could not be. Ebyan only said that

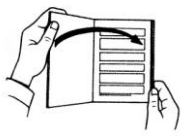
they cannot be letters and cannot be read. With the exception of one L1NL participant, it appears that none are familiar with musical notes.

Bubbles summary. The bubble devices were used for four distinct purposes, but each indicated action originated by a person. In each of the illustrations featuring the bubble as a graphic device, participants had no trouble identifying the iconic signs, the people and the shopping cart. The symbolic bubble signs were often misinterpreted as other iconic signs.

Arrows as Graphic Devices

Images #3, #5, #7, #9 make use of arrows to convey different meanings. Image #1 uses the arrow to show future movement from left to right, closing a book. In image #5 the arrow shows in-progress body movement, that of a person getting up from a chair. Image #7 uses the arrow to emphasize line of sight. In image #9 the arrow is used to bring attention to a specific part of the picture, a street corner.

#3



All participants mentioned the hands holding something in image #3. Seven identified the item as a book, one as a piece of paper, one as a blackboard. Two participants specified that the book might be a checkbook or a driver's permit book, the kind that people use to study for a driver's test. One person remarked that the left side was the hard front cover and that the book was open. Another said someone was looking into the book.

None of the participants accurately interpreted the graphic device in this image. The majority of participants (6) saw the arrow, not as a symbol for the viewer of image #3, but as something that is on the actual page for the benefit of the person who is holding it. Four of those believed that the arrow indicated a place where a person was supposed to write something. Asha believed that the arrow was showing something to whoever was holding it. Geni, who believed that the book could be from the Department of Motor Vehicles, said that the arrow was a direction about driving. "You go this way. You go that way." Although Ifrah was one of the participants who believed the arrow was indicating where to write, when asked where else she had seen a sign like this, she also mentioned arrows on the road.

The remainder of the participants (3) interpreted the arrow as a sign meant for the viewer of image #3. Khadra only knew that the arrow in the book, or possibly checkbook, "could be telling us something." Ebyan, who believed that hands were holding a blackboard, described the meaning as, "Go right." The only participant who got close to accurately interpreting #3 was L1NL Basro, who guessed that the arrow meant the book was opening, not closing, the opposite of the intended interpretation.

#5

All participants identified that a man and a chair were depicted in image #5. They all also mentioned either the man getting up or sitting down. Some used only the non-

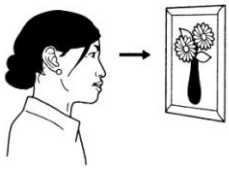
symbolic elements to determine the movement. Four mentioned, or demonstrated physically, that the man's hands and body language show that he is getting up. Three others indicated the same reasons for why they believed the man to be in the process of sitting down. Others mentioned that his body language indicated an illness, a handicap or that the chair was about to fall.

Whether the man was getting up or sitting down, the majority of the participants (5) believed that the arrow indicated pain in his back. Farhiya mentioned specifically that this was because the arrow was pointing to his back.

Four participants interpreted the arrow as indicating the man's movement upward, but only two of them were judged to have interpreted the sign accurately. Both Khadra and Deka mentioned that the arrow in image #5 indicated that the man getting up, although Deka began by saying he was sitting down but then changed her mind. Neither mentioned a non-symbolic sign that suggested he was getting up. They only mentioned the arrow. Ebyan and Geni were determined to have only given partial answers. They both said that the arrow sign was telling the man to get up, as if it were giving directions to him, not indicating in-progress movement to the viewer of image #5. Ebyan was the only participant who mentioned having seen a sign like this somewhere else, on the road.

For image #5, the two participants who accurately interpreted the man standing up from the chair were L1L. There were also two L1NL who had partially correct answers. The other five participants, L1L and L1NL, answered that the man was experiencing back pain.

#7



All participants identified a female and a flower. Five of those specifically mentioned that the flower was a picture or in a frame.

The graphic device used in this image was the most easily recognized by participants. All but one participant mentioned that the arrow tells that the woman is looking that way, that her eyes are looking into the flower or that the arrow is coming from her eyes. Two participants mentioned that the arrow is similar to road signs that say to turn some direction or a one-way sign. The one exception was the interpretation from Ebyan, an L1NL, that the arrow was a physical object, a small telescope or spyglass (as she indicated with her hands held up to her eye). She said that the woman was looking into the hole, trying to measure.

#9

Each participant recognized building, house, hotel, apartment building, building with shops underneath, hospital or a school as being the prominent iconic element of image #9. Many participants offered a number of these possibilities as the function of the building. Three participants described or pointed to the sidewalk area as a place for

parking. One person mentioned benches outside the building. Seven participants mentioned the building's entrance. No participants made any reference to *corner.*

The original form of this image was used in the *Step Forward* series (Santamaria & Adelson-Goldstein, 2007) to convey the concept of *corner.* Although it was designed to elicit the idea of *corner* by having an arrow point to a corner, not one participant in this study interpreted it as such. Most participants did identify the arrow by its intended function, to point out some important element in the image, but instead of seeing *corner*, they saw *entrance* as the target of the arrow. So, even though the iconic sign intended was consistently misinterpreted, those who recognized that the arrow was pointing the viewer to something were judged to have accurately interpreted the graphic device. Seven of the participants identified the arrow as indicating where the entrance is or where to enter. One participant thought that the arrow was pointing to the building or to the parking, which also indicates that she understands the sign. Geni mentioned that the arrow was like the signs outside that tell which way to go on the highway, specifically the highway that runs outside our school.

Ebyan, was the only participant who brought a completely different interpretation to the image. She saw the building as being under construction and that again, as in her interpretation of image #7, the arrow was something used for measurement in the building plan. In her translated words, "When they build something to make sure they don't go too far, they use this thing."

Arrows summary. Again, most iconic signs were easily identified. The arrow was used for four different purposes and participants showed varying degrees of mastery in

identifications. Some were more easily identified than others. Although interpretations were not always accurate, in nearly all cases participants were able to identify the arrows as being symbolic signs, not physical objects.

Other graphic devices

Images #2, #6, #8, #12 don't have any shared symbolic elements. Image #1 uses lightning bolts emanating from a person's head to illustrate pain. Image #6 uses a kind of invisible magnifying glass to enlarge a portion of the image for closer examination. Image #8 uses a clock face with shading between the 7 and 8, and an arrow going clockwise. This drawing is meant to evoke the idea of *one hour.* Image #12 depicts a woman pointing to part of a map. The compass rose is a symbolic device meant, in this case, to aid in identifying that what she is standing in front of is a map.

#2

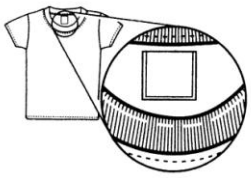
All participants recognized that image #2 depicted a person. Most remarked on, or mimicked the hands to the head. All participants identified that the person was in some kind of distress or discomfort, often suggesting more than one possibility. Suggestions given were *tired, thinking, pain, headache, fever, sick, sleep, worried, has problems* and *busy*. Seven participants cited body language and facial expression, non-symbolic elements, as at least partial reasons for determining this distress.

In addition to using the affective clues, four participants indentified, orally or by pointing, the lightning bolts as indication of either *pain* or *headache*. One more identified

the *pain* with some prompting. Those who did accurately interpret the graphic device often also suggested other possibilities, the definition judged to be the one intended being one among many. For example, Asha first suggested that the sign meant *pain* but then also *veins*. Basro, Deka and Hani suggested both *headache* and *fever*. Basro said that she had learned this from her teacher in ESL classes. No one actually used the term *lightning bolts* but Basro said that the sign was like *flashing*. Two L1NLs attempted no guess at the meaning of the sign. Ifrah said that something was going into the ears or out of the head.

Although few clear differences in interpretation abilities between the L1L and L1NL groups were shown for most of the graphic devices under focus in the study, this image was an exception. One group clearly was more familiar with the graphic device used in image #2. L1Ls all got the right idea from image #2, the headache picture. Only one L1L needed some prompting as to the meaning of the graphic device. Only two of five L1NL easily identified the meaning of the graphic device used in the image.

#6



The graphic device in image #6 proved to be the most difficult to interpret. All participants identified a t-shirt. One participant mentioned a market. No participant was able to identify the concept of magnification of the shirt's label. One participant didn't make a guess, but the other eight gave a variety of interpretations. The most common thing seen was a basketball, it being mentioned by four participants. Farhiya said, "The

ball is hanging there." She saw the square shape as a backboard of a basketball hoop and all the lines below the square as the painted lines on a basketball court. Geni drew a connection between the perceived basketball and the t-shirt. She said that the shirt matches that of a basketball team, as she has seen her sister's children wearing matching team shirts. Asha said that the ball is in the basket. She also mentioned a computer, the square shape resembling a monitor screen. Khadra commented that it looked like a ball or a hanger, but the line connecting it to the shirt confused her and made no sense.

In addition to basketball, other round shapes mentioned were a tire and a ball of thread. To Ifrah, the square might have been a book, and the vertical lines within the circle resembled those of a stereo speaker. Ebyan saw a cassette tape with the ribbon pulled out of it, connecting the t-shirt and the cassette.

#8

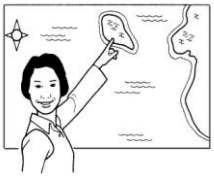
Image #8 was another difficult image. This one features two graphic devices working together to create another symbolic meaning. All participants identified a clock. All but one participant specifically mentioned that the time was 8:00.

None of the participants identified this image as communicating the passage of one hour. Five participants mentioned that the arrow shows which direction the clock is moving. Basro commented that it never goes the other way. Hani suggested that the

arrow could be counting the minutes. Ebyan said that it was guidance for the short hand. She was the only participant who made specific reference to the hour hand, and she was marked as being partially correct.

Although some participants were close to defining the function of the arrow sign in image #8, none were able to give even a partial explanation for the shading between numbers 7 and 8 on the clock face. Khadra thought the shading could be showing the minutes but she also thought it could be the shadow cast by the arrow. Deka, noticing that there was no seconds hand shown, thought that the shadow could be it.

#12



This image varies from the others in that it features symbolic signs that aren't meant solely for us, as viewers of the drawing. The map and the compass on the map are also viewable by the person in the image. The map and compass are physically present in two-dimensional form for the woman in the picture, just as they are for us. All the other signs in this study are symbols meant for the viewer of the drawing and are not physically present in the reality of the drawing.

All participants recognized a woman; three suggested that she might be a teacher. One participant thought she was somewhere buying something, maybe saying, "I'll take that one." Five said that the woman was teaching, showing or pointing to something. Exactly what she was pointing to varied.

The map in its entirety was seen variously as a blackboard or a calendar. Some participants focused on interpreting the individual shapes that are parts of the map. Khadra saw human body parts, the large island looking like lungs and the waves looked like smoke. Geni thought that the woman might be by a lake, but then she launched into an anecdote about what it was like after a rain in Africa. In telling this anecdote, she pointed toward the island as a puddle, the waves as rain and the coastline as the furrows in the dirt, caused by rain on very dry ground. Asha and Basro also brought up the subject of weather. Ifrah was on the right track, although she identified the compass as a flag's star, with one point fewer than the star on the Somali flag. Ifrah said that the waves on the map were gibberish and then pointed to the whiteboard in the classroom and said it was like a map of a state, from the shape it has. Since she didn't recognize some individual map elements, she was recorded as having given a partially correct interpretation, yet the best recorded from this sample.

Five participants mentioned *star* in reference to the compass, two mentioned *moon*, one mentioned *sun* and one mentioned *a sign.* Farhiya, who believed the picture showed someone pointing to a blackboard, recognized the shape as a compass. She says she knows the term compass from discussion in Africa of the four corners of the world, yet she didn't mention the word *map.* Although Farhiya has learned to read Somali as an adult, neither she nor Ifrah had any formal education in Africa, yet they came the closest to identifying the symbolic signs in image #12.

Other graphic devices summary. Again the iconic signs, the clock, the t-shirt and the people, presented little problem for participants to identify. Most of these graphic devices

were confusing. The sign indicating physical discomfort emanating from the woman's head was the only exception. Most participants understood that the woman was in pain, but there were cues other than the graphic devices present as well.

Chapter Summary

In this chapter the quantitative and qualitative data collected for this study were presented. The data collected from the demographic interview and think-aloud sessions were summarized and attention was brought to some unique participant responses. References to L1 literacy level were made when differences in interpretation between the two literacy level groups was noteworthy. The chapter contains further examination of participant responses and interpretations of what were felt to be the main findings and implications of what has been learned through this research.

CHAPTER FIVE: CONCLUSION

In this research project I attempted to answer the question: How does L1 literacy affect visual literacy? I hoped to gain insight into how learners interpret images that make use of common graphic devices. To that end, participants were asked to interpret illustrations from educational materials and their responses were analyzed. The following chapter will describe the major findings of this analysis. I'll identify limitations of this study that were discovered through the research process. Next, I'll discuss the implications of this study's findings for teachers, publishers, and anyone who intends to communicate with low-literate second language learning adults through visual means. Finally, I'll offer some ideas for further research from the questions that arose from this study.

Major Findings

When I began this project, I pictured myself finding two groups, equal in all ways but level of L1 literacy. I expected that participants with L1 literacy would demonstrate abilities clearly different from participants without L1 literacy. It was my belief that those with first language education would have greater familiarity with the graphic devices. This ended up not being the case. In fact, all participants demonstrated abilities lower than I had anticipated. Across the board, participants had more "wrong" answers than "right" ones. But those wrong answers provided some of the most interesting data. I had

hoped to see how the lenses through which adult learners of varying L1 educational backgrounds see things differ. I didn't find a clear answer to that question, but I discovered views that I had not expected. First, I'll address some of the more quantitative findings of the data collection. Then, I'll discuss the qualitative data gleaned from the participant responses.

In the section below I will give details on the following findings:

- Exposure to graphic devices appears more influential in visual literacy than does L1 literacy
- Symbolic signs were often interpreted as iconic signs
- Context plays a major role in image interpretation
- Participants used real-world references to interpret the images

Literacy and Visual Literacy

Boling et al. (2007) proved that there is a difference among cultural groups in the ability to interpret graphic devices commonly used in our culture. One part of my research question hoped to shed light on how this type of visual literacy differs among L1L and L1NL adults. I hoped to prove a reasonable assumption that one group or the other would clearly perform better on the picture interpretation task. This bias was not proven. No such clear data was confirmed. One group performed better at bubble graphic devices, another did better with the arrows. Below, I've again divided the comments into similar types of graphic devices to describe and interpret how the participants experienced the images.

Bubble graphic devices. Post-data collection, the types of graphic devices used were categorized into three groups; *bubbles, arrows* and *other graphic devices*. The bubbles represented four ideas, but all were related to the depiction of a person also in the image. Each bubble originally contained words. The L1NL participants, on the whole, did better at interpreting these symbols. Only one L1L participant correctly interpreted the speech bubble. Four separate L1NL participants gave responses that indicated at least partial understanding of the bubbles' meanings, and two of those immediately recognized the sign in image #1 as an indication of speech.

Basro and Ifrah seemed to comprehend the uses of the bubble as a symbolic sign better than other participants. Although Basro mentioned having seen this sign in our class, both cited having originally seen the speech bubble used in non-school contexts, Basro through newspaper comics in Somalia, and Ifrah through children's books. The L1L participant who accurately interpreted the speech bubble said that she knew what it meant from exposure in our class. These results suggest to me that the speech bubble commonly used in ESL materials may not be used in educational contexts in Somalia. They also suggest that exposure to a graphic device, in any context, is a more important factor in this kind of visual literacy than having L1 education or L1 literacy.

Arrow graphic devices. While the L1NL participants showed greater understanding of the *bubbles,* the L1L participants showed slightly better understanding of the uses of the *arrow*. Nearly all participants understood arrow signs in images #7 and #9, but only two L1L participants were able to identify that the man in image #5 was standing up. The arrows in #7 and #9 are narrow black line arrows, whereas the arrow in #5, had a

different, wider shape. It seems that many participants had a harder time determining which way it was pointed, or that it was an arrow at all. Those participants who identified arrows as signs that point in one direction cited street signs as where they had seen the arrow before. Although the L1L participants showed greater mastery of these signs, from their responses it doesn't appear that having a background of formal education contributed to that knowledge as much as having been exposed to street signs.

Other graphic devices. With the exception of image #2, the interpretations of the *other graphic devices* proved problematic for all participants. Three of the four L1L participants identified the symbols in #2 as meaning pain or headache; whereas, only two of the five L1NL participants was able to do so. Of the two participants who came closest to identifying the compass on the map in image #12, one was L1L and one was L1NL.

Quantitative findings summary. The L1NL participants showed greater understanding of the bubbles and the L1L participants showed marginally greater mastery of the arrows and other graphic devices, but the data is inconclusive. It cannot conclusively be said that one group, as a whole, had greater visual literacy than the other, but if we look at individuals, we can see that the two participants who had the most success interpreting the graphic devices are L1NL.

When it comes to these symbolic signs, why are Basro and Ifrah more visually literate than the others? Maybe Feldman's (1976) argument is true, that semi-literate and illiterate people, in order to cope with our world, better learn to read visible language. Through spending a lifetime reading, not words, but other visuals, a person can become more accustomed to the ways that images are used to communicate. Though Basro might

not have been able to read the words in the comics she looked at as a child, she was able to find enjoyment "reading" the pictures and became aware of some graphic conventions used in the comics medium. In Ifrah's case, too, she learns by experiencing picture books alongside her children. Exposure to the symbols under focus in this study can come from many sources. When it comes to visual literacy, at least from what was demonstrated in this study, it seems that the experience an individual has with visuals in any context is more significant a factor than her lack of print literacy.

Symbolic Signs and Iconic Signs

In some cases, previous exposure to graphic devices led the participant astray. On a few occasions a participant mistook one symbolic sign for another symbolic sign. The headache sign was interpreted as fever. Participants who accurately interpreted the speech bubble saw other types of bubbles as speech bubbles too. The arrow behind the man in image #5 was seen as a symbol meaning pain. Participants knew that there existed a symbol that meant pain, the placement looked right, and man's body looked as if he were uncomfortable. These contextual clues led to misinterpretation. The importance of context is discussed later in this chapter.

Symbolic signs interpreted as non-symbolic signs. The best windows into how the lenses of the participants in this study differ from my own view, are through the misinterpretations that were offered. Many of the participants saw things that I can't. Though in a few cases participants interpreted a symbolic sign as different symbolic sign, in the majority of misinterpretations the symbolic sign was interpreted as an iconic sign. When participants described the part of an image that contained a symbolic sign, or were

prompted to do so, and didn't recognize the graphic device, the interpretation they gave was most often as a physical entity in the reality of the image, not a symbolic sign included for the benefit of the viewer of the image. This observation lends credence to Ong's assertion that those from oral cultures think in a more concrete way than those from literate cultures (as cited in Bigelow & Tarone, 2004). In fact, most iconic elements were easily named by participants. People from non-literate cultures can be confused when our culture emphasizes more symbolic learning. L1 literacy seems less of a factor in visual literacy than this difference in cultural background.

The non-symbolic interpretations of symbolic signs often resulted in unanticipated descriptions of the illustrations. Artistic conventions common in culture, like the ones mentioned by Schiffman (1995), caused misinterpretations by participants for whom these conventions were unfamiliar. Although their ideas did not match the meanings intended by the artist who drew them, or the publishers of the materials from which they came, participants showed ingenuity in making sense of what they saw, which certainly must have been confusing at times. Those who didn't recognize the various bubble signs used whatever context was available to make sense of the devices. Those ideas were almost always iconic signs such as a door, blackboard, access card reader or scanner, mirror, pen. Sometimes the context didn't help out and participants said the bubble was just some unidentified something that is behind the people in the picture, but definitely a physical object. They used the facial expression of the woman in image #4 to identify that she was upset. Four participants built a story from there involving the thought bubble as a physical source of the woman's problem. The bubble that was meant

to indicate a group singing in image #11 was seen as the sun, a bug and a recording device. Participants saw the shapes of the musical notes contained within the bubble as drawings of eyeglasses, earphones and animals. If I hadn't seen a musical note before I'd say that those shapes looked like a squirrel and a bird too. The most confusing sign was the magnification of the t-shirt in image #6. Perhaps the removal of the letter indicating size also removed too much context from this line drawing for participants to recognize that there were two similar images: one large, one small. Each participant named the T-shirt without hesitation. The shapes in the magnification were interpreted as other iconic signs, although I could see that none of the participants was confident of her interpretation. It was difficult to create a logical story connecting that T-shirt to the round shape.

In analyzing the data with an eye towards what this means for a classroom teacher, I noticed that sometimes the symbolic sign isn't needed in order for the picture to be understood. Ebyan was the only participant who saw the arrow coming from the woman's eyes in image #7 as an iconic sign, some kind of telescope. It's interesting that in classroom use, this misinterpretation would likely not be noticed, nor would it likely have influenced her ability to complete any class activity related to the picture; whether the arrow is a graphic device indicating the woman's line of sight or it's a telescope, she is looking at a picture of a flower. The same goes for how Ifrah responded to images #11 and #12. Without recognizing the musical notes in image #11, she suggested that the people were probably singing. She also said that what the woman is standing in front of in image #12 looked like a map, but she identified the compass rose as a four-pointed

star. Not understanding the musical notes or the compass rose would likely not interfere with understanding the image at the level needed for a classroom activity. Further thoughts on what classroom teachers can gather from this study are discussed in greater detail later in this chapter.

The Role of Context in Interpreting Signs.

As mentioned above, the iconic context aids in interpretation of symbolic signs as well as the overall meaning being communicated by the image. Most participants were able to identify that the woman in image #2 was sick or had a headache just from looking at the placement of her hands on her head and from her facial expression. Ifrah identified the group singing in image #11 from the group's positioning and open mouths, not from the music notes. Hani was another participant who was able to understand one element, the speech bubble. She said that it was, "...what they are screaming from their mouths." This is noteworthy because she did not identify the speech bubble in image #1. It is possible that she used the greater context of image #11 as a clue that was not present in image #1. The man shopping in image #10 was easily identified and used as a context for creating a meaning for the bubble. Participants largely gave interpretations related to the expected environment of the shopping situation. The context could also steer participants wrong, as happened in image #5. The bent body of the man standing up misled five participants into interpreting the arrow as an indication of back pain. In many of the pictures, much of the context, including text, had been removed, making interpretations more difficult. Instructional images might be able to communicate more reliably when they contain ample context. This idea is further explored in the implications section.

Participants were very good at identifying the iconic signs. Only for image #9 did participants consistently name the symbolic sign but name an iconic sign that was not the intent of the artist. Image #9 was intended to convey the concept *corner*, but the placement of the arrow suggested to eight participants that it was pointing to the door or the building. I believe that a slight adjustment to the picture would have resulted in more *corner* interpretations.

Real-world Interpretations

Another tendency that was observed was how participants brought *real-world* experiences into their interpretations. They often saw the graphic devices as signs instructing someone to do something. This is supported by DeCapua and Marshall's (2010) observation that students with limited or interrupted formal education tend to find more value in pragmatic situations than in symbolic ones that have little bearing on the immediate. Consequently, one reason that may have caused participants to see the arrow pointing to the entrance in image #9 is that there is a legitimate, *real-world* reason for an arrow to be pointing to a door, so that one can find the way in. It's hard to think of a practical reason why an arrow would direct one to a corner, the meaning intended by the image. Similarly, four participants saw the arrow in image #3 as being a sign directing a person to write in a particular place in the book. It was explained to me by the L1 interviewer that this type of arrow, usually in the form of a colored sticker, is often used by government and social service agencies to guide clients with limited English proficiency to where they need to sign or fill in information. So, some participants have direct experiences that counter the symbolic meaning intended by the artist.

Another aspect of the *real-world* view recorded in the data was the inclination to see the symbols as part of the reality of the illustration, not as something drawn to convey something to the viewer of the image. Above, I discussed how misunderstood symbolic signs were largely interpreted as iconic signs, physically present in the reality of the image. I also noticed that often when the symbols were recognized as symbols, they were interpreted as being symbols visible within the reality of the picture. When people were depicted, some participants thought that the symbols were meant to be seen by the people in the picture, as in the book example above. Six participants gave an indication that the sign on the book was visible to the person holding it. Two participants said that the arrow in image #5 was telling the man to get up, as if a road sign was giving him direction. It's not clear, but the arrow pointing to the building may have been a directional sign physically outside the building. The shading used in image #8 to show the passage of time was seen by one learner as a shadow cast by the clock's hand, something that does happen in the real world.

The participants in this study were less likely to see graphic devices as symbols to indicate something to the viewers of a picture, signs used to enhance static, two-dimensional images. They tended to bring realistic interpretations to the signs that were more pragmatic and likely to be viewable to the people in the images and in the three-dimensional real world around us.

Limitations

One limitation of this study is related to the convenience sample of adult students who participated in this study. I had intended to have 50 percent of my participants L1NL

and 50 percent L1L, but with other attributes such as age, length of time in the U.S., years of ESL study, and CASAS scores, as balanced as possible between groups. I wanted to make my results as reliable as possible, but I found it difficult to find many L1L participants on data collection days, so had to take whoever was available. Of the L1L participants, only one had more than 2 years of L1 education, and two had only gained L1 literacy in their adult lives. Having five L1L and five L1NL participants, instead of the four and five we ended up with, still, would likely not have shown conclusive results as to characteristics of each group. A much larger sampling might have better revealed differences between L1L and L1NL visual literacy.

This study was limited, in some ways, by the difficulty of the image interpretation task. It's hard to consider a test valid if none of the test-takers got even 50 percent correct and most did much worse. Although these misinterpretations provided interesting information on how beginning adult ELLs see symbolic signs, the fact that so few of the graphic devices were accurately interpreted made other data unavailable. For example, I had hoped to be able to find out more about where and how participants learned about the graphic devices, but since they had not yet acquired that knowledge in most cases, that line of questioning was rarely employed.

Participant affective factors may also have interfered with data collection. Some participants were more willing to speak. Some were willing to take guesses when unsure, and this resulted in some interesting data. But others were more reticent and only described images when they were confident of their answers. Two participants may not have performed as well as they could have due to being distracted by the L1 interviewer's

note-taking. These participants' curiosity made them try to peek at the L1 interviewer's data collection tool as she was circling *yes* and *no.* After the first data collection session, a modification was made to data collection tool #2 [Appendix D], changing *yes/no* to a triangle and a circle, but the writing was still somewhat distracting.

The participants' responses may have been influenced by the curriculum of the previous month. Most classes had just finished a health care unit, and consequently health-related pictures were fresh in participants' minds. This likely helped participants accurately interpret the *headache* symbol in image #2. The recent exposure to health-related pictures also may have led to some inaccurate ideas. Participants mentioned health-related interpretations for images #4, #5 and #12.

Implications

What do these findings mean to teachers of English to students with limited educational backgrounds? In this section I discuss what I feel to be some of the implications of this study, including ideas on the following:

- how visual literacy is gained,
- why it can and should be taught,
- which types of images are more reliable,
- why ample context needs to be included for images to be understood,
- why images are important in working with learners with limited literacy background, and
- how visual literacy levels vary.

Teaching and Learning Visual Literacy

Given that so many of the participants were unable to interpret the functions of the majority of the graphic devices, one major implication of this study is the recommendation that students be taught what these signs mean. As mentioned above in the section on the limitations of this study, the teachings of the previous month influenced participants' perception of the images used. That influence may have led to both correct and incorrect interpretations, but it does imply that these signs are learnable and teachable. Given that so many participants were unfamiliar with the symbolic signs, the results of this study might suggest to a teacher that he should avoid using graphic devices in language instruction, but graphic devices can be added to students' visual lexicon along with the rest of the content being learned. These signs are common in our culture and need to be learned to become fully literate. Teachers of students from backgrounds that tend to rely less on these graphic devices may choose to explicitly draw attention to these devices as they are used. Teachers cannot assume that students from diverse backgrounds share the same visual literacy concepts.

Participants gain visual literacy from a variety of sources. Some participants cited school, specifically our ESL classes, as sources of their knowledge of the graphic devices under focus in this study. Most participants mentioned knowing about arrows from street signs. Three participants mentioned the topic of *weather* when describing image #12. Although these participants didn't say the word *map,* it could be that the iconic and symbolic signs in that image resembled a TV weatherperson in front of map. Basro and Ifrah learned about speech bubbles through cartoons and kids books. Though these signs

may not have been part of daily life in Somalia, the fact that they have been learned through a wide variety of educational and non-educational sources points to the fact that visual literacy is learnable, and therefore teachable, and that formal education is not the only way of gaining visual literacy.

Iconic Images in Context are more Reliable

In the present study it is clear that symbolic signs are less easily recognizable than iconic signs. When pictures rely on unfamiliar graphic devices to convey meaning, it can cause confusion. If teachers can choose to employ images than rely more on iconic imagery, students may be more likely to understand the meanings intended. In this research some of the images were interpreted as intended without the need to understand the graphic devices used. The context of the picture, body language, facial gestures, or setting, was all that was needed. Image #2 used redundant signs, both symbolic and non-symbolic, to convey that the woman had a headache. For some students the iconic signs are enough to understand the meaning. Other students might use the iconic signs to figure out what the symbolic sign means. Iconic signs provide context for understanding symbolic elements. In this study much of the context was removed from the images, including all text. Most of the illustrations were altered from how they might be seen in class. The fact that there were four participants who were not able to interpret any of the four *bubbles* used in this study tells me that the inclusion of words, or the greater context under which these bubbles are regularly encountered is what makes these materials intelligible when students are exposed to them in class. Educators and producers of

educational materials should be careful to include enough context in illustrations so that symbolic signs alone are not relied upon to convey meaning.

Visuals are especially Useful with Low-literate Learners

Consideration of the fact that the two participants who successfully interpreted the greatest number of graphic devices were L1 non-literate may suggest that there is something special about how they see images. Though this research project has demonstrated that the symbolic signs we use are not universally understood, visuals are very effective instruments in communicating meaning. The participants who were among the least formally educated showed greatest visual literacy skills. As non-readers, they may have developed better *logographic* reading skills. As this kind of student begins to gain literacy skills, images can be important common grounds from which to begin.

As with Print Literacy, Visual Literacy Varies

There is one more implication that I will take with me as I continue to teach these adult students: an awareness of the varying levels of visual literacy within one class. Ebyan and Basro began my class on the same day a few years ago. They are good friends and they come to school together. Ebyan does somewhat better at standardized tests and following classroom directions, but generally, I've thought of them as being around the same skill level in speaking, listening, reading and writing. From the interviews conducted for this study, I've learned that there is a wide gap between them in terms of visual literacy. Though they seem to perform literacy tasks at nearly the same level, Basro was the most successful at interpreting the graphic devices she was presented with and Ebyan was the least successful. Basro's life experience may have exposed her to

symbolic signs to a greater degree than had Ebyan's. Educators should be aware that all students have varying degrees of various kinds of literacy.

Further Research

A mixed-method, but mostly qualitative study like this one can bring about more questions than answers. Ebyan and Basro have similar backgrounds on paper, but their visual literacies are distinct. I would like to know why. A future study could interview such participants and dig deeper into their backgrounds and daily lives to find out why they performed so differently. There must be some factors that contribute to greater awareness of symbolic signs. Ifrah said that she learned about the speech bubble from kids' books. If I could retroactively add another question to my demographic interview, it might have something to do with exposure to children or grandchildren who attend U.S. schools. A larger study could include not only beginning adult ELLs, but also higher level ELLs as participants who might have greater community interaction and more time the U.S. This would permit a researcher to learn about the visual literacy of people along different points of language acquisition and cultural integration.

Among the major findings of this research was that an image's context plays a major role in the interpretation of symbolic signs. A logical follow-up study would be to compare the understandability of context-removed images like the ones used in this study and images with their contexts intact. In this study all text was removed from the illustrations to keep participants' focus on the images. A comparison study having participants interpret images with a textual context and images with text removed could also point to how context affects comprehension of graphic elements.

Of the many curricular options available to teachers, there are books whose illustrations use more symbolic signs, and books, purposefully or not, that avoid those signs. It could be interesting to do a side-by-side comparison of how a number of publishers have chosen to convey similar concepts through symbolic or non-symbolic signs. Again, human subjects could be consulted to give their interpretations or tell which they prefer. A student's point of view is important to consider when designing and choosing educational materials. Further study of how people learn by seeing could result in more effective communication for both L1 literate and non-literate learners.

Conclusion

In this research I inquired as to how the lenses of L1L and L1NL might differ when they saw illustrations used in class. I can't say that this question has been answered in any definitive way, but I have shed some light on how both groups of beginning ELLs saw the 12 pictures I presented to them. More important to me personally, and to my current and future students with limited literacy backgrounds, I now have a better idea of some ways that educational illustrations are seen by those with other backgrounds. In many cases the potential views are different from what I had expected. I see things clearly that my students don't. By the same token, I've found that they see things in pictures that I'm not immediately able to.

In my classroom I have a collection of reading glasses for when students forget their own at home or for trying out if we think that someone is having trouble seeing a page. As a result, an unexpected part of my job has become amateur optometry in helping students find the appropriate power of reading spectacles for their eyes. Each person

differs, but after doing this for a few years, I can usually make a good guess based on my past experiences. Through this research, I now know that students' vision differs in other ways as well. I am aware that the metaphorical lenses through which each person sees illustrations vary. From the data I have collected, I'm now able to make good guesses as to the types of illustrations that might prove to be problematic. These findings can be used to help me better see two-dimensional images the way my low literate students do and to predict the types of visuals that will cause problems. I can also use this information to help them try on lenses from my point of view as I help them improve their literacy and their visual literacy.

APPENDIX A

Somali Native Language Literacy Screening Device (NLLSD) (Tarone et al., 2009)

Native language literacy rating scale

Rating	
	Reading fluency
1	Follows with pen; much sub-vocalizations; slow speed; retraces/backtracks; much comprehension difficulty; asks researcher for help.
2	Starts out slowly and then speeds up, still showing some difficulty in decoding; may follow with pen or finger and/or sub-vocalize; often reads twice, much faster the second time.
3	Very comfortable; little sub-vocalization; speed relatively quick; little comprehension difficulty; may comment on perceived orthographic errors in the Somali text.
	Writing
1	Writes in another language, can/will not write in native language.
2	Writes laboriously in native language; may complain about not knowing how to spell; sub-vocalizes; may ask for help.
3	Writes in native language without hesitation.
	Confidence
1	Expresses reluctance to read or write in native language; may say cannot do it.
2	Will try, but not very sure of skills; asks questions along the way.
3	Approaches task without hesitation.

NATIVE LANGUAGE LITERACY
SCREENING DEVICE
(SOMALI)

Gacaliye Barte:

Ku soo dhawow dugsigeena.

Wuxu foomkani gacan naga siinayaa sidii aanu hadda go'aan uga gaari lahayn dariiqada ugu fiican ee barnaamijkani wax kuu tari lahaa .

Fadlan adigu buuxi foomkan.

Haddii aanad su'aalaha dhammaan ka wada jawaabi karayn, qaybaha aad ka garato meelahooda ka buuxi foomka, inta ka hadhana iska dhaaf ha banaanaatee.

Mahadsanid.

Taariikhda Maanta:_____

Taariikhda dhalashada: _____

1. Xaggee baad ku dhalatay?

2. Sannadma ayaad timid dalkan Maraykanka?

3. Imisa sannadood baad dalkaagii dugsi ka dhigatay?

4. Hadda kahor fasallo Ingiriisi lagu dhigayo dalkan Maraykanka ma ka qayb gashay?

5. Ma xaas baad tahay?

6. Caruur ma leedahay?

7. Waa maxay luqada dalkiina aad kaga hadashaan?

_____

8. Ma jiraan qaar aad ka akhridaa Joornaalada afka Somaliga ku soo baxa?

_____

9. Waa maxay shaqada aad qabataa?

_____

10. Marka aad hesho waqti firaaqa ah, maxaad jeceshahay inad qabato?

_____

Aad baad ugu mahadsan tahay su'aalaha aad ka jawaabtey.

_____

Sheekooyin ku saabsan arday kale oo u yimid
dugsigan inay Ingiriisida ka bartaan ayaa
ku yaal bogagga soo socda.

Fadlan akhri sheekooyinkaa.

APPENDIX B

Data Collection Tool #1 - Demographic questionnaire

date:

participant: #

Interview

Can you read in a language other than English? (Somali, Arabic, Oromo)
yes/no/some/a little

What do you read?

Did you go to school in Africa? yes/no

If so how many years? # 0 / 1 - 5 / 6 - 8/ 9 -12/ hs diploma or greater

What kind of school?

How long have you lived in America? # months / years

How long have you gone to school in America?

Have you had a job outside the home in America? yes/no

Do/did you use English in that job?

APPENDIX C

List of graphic devices and their functions.

	device	**function**
model	waves	sound (listen to computer)
model	circle/line	prohibition (bicycle)
	1.bubble	speech
	2. lightning bolts	pain (headache)
	3. arrow	future movement left to right (close book)
	4. bubble	thought
	5. arrow	body movement (stand up)
	6. larger image	magnify (t-shirt size)
	7. arrow	line of sight (at picture)
	8. shading/arrow	passage of time
	9. arrow	to draw attention to important part (corner)
	10. bubble	magnify/explain (shopping list)
	11. bubble/musical notes	singing together
	12. compass rose	indicate that image is a map (island)

APPENDIX D

Data collection tool #2 – Interviewer checklist

#	Y	N	graphic device	key words
1	❒	❍	speech bubble	speak, talk, say
2	❒	❍	lightning bolts	headache, pain, hurt
3	❒	❍	movement arrow	close, turn page
4	❒	❍	thought bubble	think, decide, wonder, choose, don't know
5	❒	❍	action arrow	stand, up
6	❒	❍	magnified image	big(ger), (too) small(er), close(r)
7	❒	❍	sight arrow	she sees, looks at, watches
8	❒	❍	time arrow	one hour, five minutes, one minute, time is going/passing
9	❒	❍	attention arrow	corner, sidewalk, entrance
10	❒	❍	bubble explains image	big(ger), (too) small(er), close(r), writing/words
11	❒	❍	bubble shows many voices	everybody, together, all, talk, say, speak
			musical notes	music, song, sing
12	❒	❍	compass symbol	map, country, island

APPENDIX E

Data collection tool #3 - Observation notes. Images from *Step Forward* series.

(Santamaria & Adelson-Goldstein, 2007)

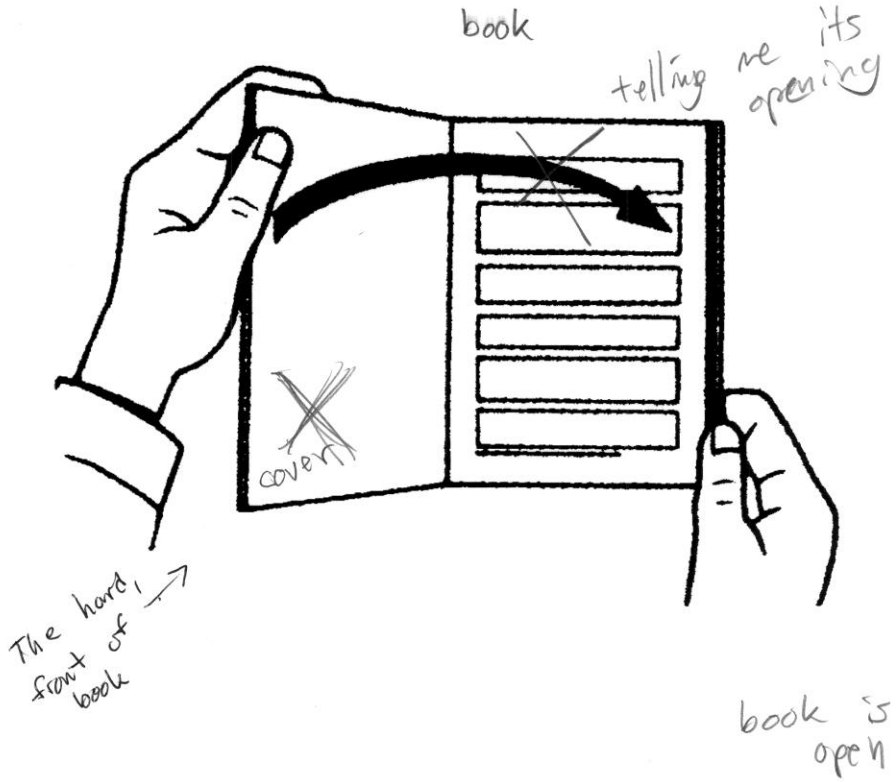
sinyalen' "~~blinking~~ flashing"

headache or fever

2 headache		Gesture	Language	other
	Iconic	hurts head	woman "flashing"	teacher taught
YES NO	Symbolic	flashing	~~lightning~~ woman having pain	

2

B



3 book	Gesture	Language	other
	Iconic		
YES NO	Symbolic		said open instead of close

B

4 thought	Gesture	Language	other
Iconic	hand to mouth + noise		
Symbolic		air	

YES NO

B

APPENDIX F

Participant letter of consent

Hamline University Graduate School of Education

Human Subject Research Information

CONSENT LETTER

To Adult Options Students Requesting Permission to Take Part in Research

June 1, 2011

Dear Adult Options Learner,

I am working on my Master's degree in ESL (English as a second language) at Hamline University. To finish my degree, I need to do research in our classroom. I want to learn more about Somali adult students so that I can teach them better. My capstone project will also be published for scholarly use, and shelved in Hamline's library so that other teachers can learn from it.

To participate in my research, you will be asked a few questions about your education and be instructed to talk about some pictures from our English books. Some of this will be in Somali. Your responses will be recorded on paper and by video. You will miss some of your class on one day so that you can be interviewed. During this time you may benefit by learning more about the pictures we use in class.

When I write my report, I will not use any student's real name. All the information I collect about you will be private and I will erase the video when I am finished. If you don't want to be in this study, that is OK. Also, you can decide to quit participation at any time.

I have permission to conduct this study from Adult Options in Education, Hopkins Schools and Hamline University. I also need to ask for your permission.

If you have any questions, please contact me at daniel_bruski@hopkins.k12.mn.us (952-988-4155) or Ann Mabbott at Hamline University: amabbott@hamline.edu 661-523-2446.

Thank you,

Dan Bruski

If you want to be part of this research study, please sign both copies of this letter. Keep one copy for yourself and return the second page to me.

Signature: _____ Date: _____

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