¡Eye græftk Semiosis!
A Cognitive Approach to Graphic Signs and “Writing”

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## Table of Contents

1. INTRODUCTION ................................................................................................................. 3
   1.1 UNDERLYING PROBLEMS .......................................................................................... 3
   1.2 SEMIOTIC SIGNS ...................................................................................................... 5

2. SEMIOTIC GRADATION OF VISUAL SIGNS ........................................................................ 11
   2.1 EARLIER CONTINUUMS ............................................................................................ 11
   2.2 WRITING SYSTEMS AND VISUAL SYMBOLS ............................................................ 14
       2.2.1 “Writing Systems” ............................................................................................. 14
       2.2.2 Abstract Writing and Visual Symbols ................................................................. 20

3. WRITING SYSTEMS OF THE WORLD AND THE CMGS .................................................. 28
   3.1 ENGLISH .................................................................................................................... 30
   3.2 CHINESE ..................................................................................................................... 30
   3.3 JAPANESE .................................................................................................................. 31
   3.4 EGYPTIAN HIEROGLYPHICS .................................................................................... 33
   3.4 NAXI ......................................................................................................................... 35
   3.5 BLISSymbolics AND Universal Writing Systems ....................................................... 36
   3.6 SUMMARY ................................................................................................................ 39

4. INTERPRETING THE COGNITIVE MAP ............................................................................ 39
   4.1 STRUCTURAL ............................................................................................................. 39
   4.2 SOCIAL UNDERSTANDINGS AND INTERPRETATIONS ............................................ 47

5. CONCLUSION ....................................................................................................................... 54

ACKNOWLEDGEMENTS ......................................................................................................... 57

REFERENCES .......................................................................................................................... 57
1. INTRODUCTION

Writing has often been deemed as the greatest of all human inventions because of its ability to allow spoken language to transcend spatial and temporal boundaries. In literate cultures, it permeates all of society, underlies science and technology, and can empower individuals with the social potentials it allows. Yet, despite the important role it plays in culture, its analysis remains wrought with problems. Writing systems have generally been identified by labels such as alphabetic, syllabic, or consonantal, or in the broad categories of phonographic, logographic, or ideographic. However, these groupings only describe the manner by which these systems map to properties of the spoken language and cannot capture the evident richness of the signs involved, most significantly the semantic contribution of the graphic nature of the signs. Because semantics is the purview of the mind, any investigation of its role in writing and graphic signs must be framed as a “cognitive” endeavor – by using behavioral evidence to point toward understanding underlying processes and cognition. By examining properties of existing systems throughout the world, this aspect of graphic semiosis will be shown to map a continuum that makes up the “cognitive space” of various graphic systems by balancing a range of semantic and phonographic values. Such analysis will contend with several common assumptions about writing including the notions used to define them, their analysis as homogenous systems, the conception of their invention, the nature of their relationship to other visual signs, and the universality of the category of “writing” in the first place.

1.1 Underlying Problems

There are two main issues pervading the studies of writing systems that hamper an adequate investigation of their cognitive properties.

The first of these concerns can be exemplified by remarks from a recent textbook, which defines “writing” as “the use of graphic marks to represent specific linguistic utterances… Writing is related to language, not to ideas in general” (Rogers 2005: 2). Like most studies of this topic, this designation reflects research that asks the question,
“Is this writing, and how does it fulfill the functions of that definition?” This position is problematic as it opens the door for circular analyses that offer up a definition for “writing” then seek to include all that falls within that category, while excluding all those that do not meet the criteria. As such, it universalizes potentially relativistic cultural notions such as “writing” and “art,” drawing the boundaries between the two through the definitional determinism of the theorist, despite their clear connections found between representations in the graphic domain. Rather, these artificial boundaries between writing and graphic communication lie above the level of structural analysis, and only describe how those semiotic processes come to be categorized in a language by a culture, and do not necessarily reflect the empirical content of the signs themselves. Rather, a more beneficial starting point for research of visual signs would be, “how do the varieties of visual signs, both with or without features mapping to sound, express concepts, and what does that tell us about the human mind?”

Secondly, most categorizations of “writing systems” take a top-down approach by identifying an overarching commonality to the system, often based upon features of the spoken language that it maps (ex. featural, segmental, syllabic, alphabetic etc.) or general semiotic properties (ex. ideographic, phonographic, etc.), only then seeking out the relationships between these systems. However, despite these divisions, the actual signs employed within a system can vary greatly in their properties, and by identifying only the larger commonalities, such diversity goes unnoticed and unacknowledged. Mistaking the “forest for the trees” in visual sign systems often can be attributed to the first issue raised above. Research has focused so much on how these systems fulfill the category of “writing” that a concerted focus has been placed upon their value as sound-based systems, while ignoring their qualities as visual signs and how such sound mapping emerges.

In contrast, the approach herein will attempt to construct a categorization of visual signs from bottom-up, by identifying the salient features of visual signs and then observing how they unite within larger orthographic and graphic systems. Not to be misunderstood though: systems such as “alphabets” and “syllaberies” are indeed identifiable and can ultimately work in concert with the approach advocated herein.
However, just as this study asks a different motivating question, it will yield a different type of answer.

1.2 Semiotic Signs

Since the analysis of meaning has often fallen under the general field of semiotics or semiology, it marks a good starting point for the discussion of visual signage. The most popularly known originator of this field was the Swiss linguist Ferdinand de Saussure (1857-1913), who explained in the lectures compiled in the posthumous *Cours de Linguistique Générale* that writing falls into two primary types ([1916] 1972): phonographic and ideographic. Phonographic writing is assumed to represent speech sounds in their units, while ideograms show full ideas. While these categories had arisen before Saussure (traceable to earlier in the 19th century with the discovery of Egyptian hieroglyphics), they fit perfectly into his analysis of the “linguistic sign,” which represents the inseparable relationship between a sound image and a concept –a signifier and a signified ([1916] 1972: [99] 67, altered):

Saussure’s “sign” expressed the relationship between a representation of speech and the concept to which it referred, and thus remained arbitrary, since the words of a language do not have any direct correlation to their meaning except through convention. Because of this, phonographic and ideographic categories for writing easily fulfill the binary nature of the linguistic sign. He writes, “The system [which is] often called ‘phonetic’, [is] intended to represent the sequence of sounds as they occur in the word. Some phonetic writing systems are syllabic. Others are alphabetic, that is to say based upon the irreducible elements of speech” ([1916] 1972: [47] 26). This easily maps to the
sound image aspect of his binary pair, while “the ideogram and the spoken word are of equal validity as signs for an idea” ([1916] 1972: [48] 27). That is, for Saussure, an ideogram maps directly to the object of reference, without connecting to the sound image, thereby becoming a “signifier” unto itself:

Later on, in his recasting of Saussure’s work, the America Structuralist Leonard Bloomfield used the term “logogram” in place of “ideogram” (1933: 287), meaning that these graphic signs stood for morphemes or whole words, an idea that became solidified in the literature by Gelb (1963). This effectively brought “ideograms” into the realm of the sound image and away from a direct connection to the concept realm, echoing the anti-“meaning” sentiment held by the American structuralist movement dominating the field of linguistics in the early twentieth century as a whole (Harris 1993). Given the focus on defining and explaining the mapping of sounds to graphics since then, these sentiments have remained pervasive in the study of writing.

Nevertheless, Saussure’s proposition is problematic as a categorization because it does not actually address the semiotic properties of visual representations. His essence of an arbitrary relationship holds true for spoken language because sounds indeed cannot denote concrete referents except through symbolic representations (even onomatopoetic lexemes are conventional and arbitrary). However, this is merely a restriction of the semiotic modality of sound, not the semiotic properties of signifiers – whether spoken or visual. Clearly, the visual channel allows non-arbitrary meaning in the form of images, which, by these qualifications, cannot be factored into Saussure’s schema except as an alternate non-arbitrary type of ideogram, leaving writing as the only linguistic form of graphic representation because it maps directly onto the split parts of the sign. Yet, this denies the fact that several writing systems incorporate non-arbitrary signs and vary quite greatly in the degrees to which they contain phonemic and semantic properties.
Adherence to an ideological framework that over-generalizes the actual qualities of graphic signs glosses over these differences and makes them peripheral to the broader categories of phonogram, ideogram, and logogram. Because of this, Saussure’s argument becomes internally circular and restricted merely by modality: linguistic signs must be arbitrary because they are defined by sound-concept relations, but all sound-concept relations must be arbitrary because of the nature of sound.

Thus, modalities that have characteristics unlike sound are necessarily excluded not only from consideration as linguistic objects, but also from being analyzed in any way on an even par with speech. This is detrimental to a phenomenon such as writing, since it must deal with the acknowledged linguistic signs of the sound domain, yet should also account for the properties of a graphic modality that Saussure’s analysis overlooks.

To achieve these aims, it is useful to bring in the work of another major root of semiotic theory, the work of American philosopher Charles Sanders Peirce (1839-1914). Originally designed to provide a basic theory of the logic of science, Peirce’s explication of semiotic types have since been applied to the studies of language and communication, though in his own writings he never directly addressed writing or graphic signs. His theories will not be directly appealed to here as a strict ideological rubric, though they will inform and shape the understanding of the endeavor.

For Peirce, a “sign” is something that carries meaning for somebody, thereby involving a three-part relationship between a sign (or representamen), the meaning carrying unit; an object, the unit’s “real world” referent; and an interpretant, the idea or concept instantiated in the mind of a person (Parmentier 1994: 28, simplified):

All three of these parts are necessary in any conveyance of meaningfulness, and “the solid and broken arrows depict, respectively, the vectors of determination and representation” (Parmentier 1994: 28).
By recognizing this tripartite division, Peirce clarifies a glaring ambiguity in Saussure’s analysis. While the representamen aligns with a signifier, the signified can refer to either the interpretant or the object without distinction.\footnote{This conflation leads to broader ramifications as well. The perception that referents are inseparable from mental concepts contributes to a solipsistic perspective of meaning (and possibly of “reality”), rather than a co-dependently arising relationship of both mental and physical factors.} By separating the two, Peirce is then able to elaborate on the nature of the relationships between the parts involved in this division into three trichotomies.

First off, the representamen can be a \textit{Qualisign}, a \textit{Sinsign}, or a \textit{Legisign}. Simply put, a qualisign is anything with a \textit{quality} in the world. Peirce likens this to “a feeling of ‘red.’” Meanwhile, a sinsign is the application of a quality as “an actual existent thing or event which is a sign” (Buchler 1940: 115). In this way, a sinsign is the \textit{occurrence} of a type of sign. Finally, a legisign is particular in that nothing about the qualities or context in which it appears has bearing on its status – meaning that it relies on a cultural understanding. In other words, it is \textit{conventional} as a regularized instance. This is an important distinction that will be returned to shortly.

Because a sign can only be meaningful through its relationship to an object, the most defining characteristic of a sign comes through the interface of representamen and object. This interface takes on one of three types of characteristics. These distinctions are Peirce’s most well known contributions to semiotics, though they are often taken in isolation without bearing in mind the other aspects to the sign relations. He identified three main categories in which signs relate to their objects: \textit{Icons}, \textit{Indexes}, and \textit{Symbols}.

An icon is, in Peirce’s words, “a sign which refers to the Object that it denotes merely by virtue of characters of its own” (Buchler 1940: 102)\footnote{All citations to Peirce are from Buchler’s (1940) edited collection of his papers.}. Icons have a relationship of resemblance with the objects they signify – they are similar to what they represent. In other words, an icon aligns the sign and the object with each other to draw out meaning:
Stereotypically, these would be pictures or images; a photo or drawing of Mahatma Gandhi (sign) relates to the real person Mahatma Gandhi (object) because it resembles him perceptually, and people have some conception of who Mahatma Gandhi is (interpretant). Contrary to Saussure's focus on arbitrariness, iconicity can enter the verbal modality as well. For instance, imitation of another person's voice iconically resembles that other person. Peirce also conceived of subclasses of each major semiotic type, though for brevity's sake they will not be discussed here.

Indexes, on the other hand, have “no significant resemblance to their objects,” (Buchler 1940:108), but hold a physical or causal connection to their object of signification. An index somehow connects the sign and object together through contiguity or proximity of some sort:

This connection might be close in space, in time, through causation, or metonymically through a part-whole relationship. One of Peirce’s examples of this sort of relationship is of a weathervane, which indicates the direction of the wind by its effect on the orientation of the vane. A photograph can also be an index, because it holds a causal connection to the moment that it was taken. Another example would be how smelling lingering cleaning fluid is a sign of a freshly cleaned room, or how seeing the leg of an elephant is an index for the elephant as a whole; the leg does not tell you what the animal is, but it can imply the whole by showing one part.

Finally, a symbol is understood by neither resemblance nor correlation, meaning that its only conception comes through convention or rule. In other words, the sign and object share no formal relationship whatsoever:
Most obviously, words fall under this category because the string of sounds made in forming them in no way relates to their meaning. A symbol’s representative nature is arbitrary to its object, and thus equates to Saussure’s “linguistic sign” (Pericean terminology for “sign” shall be retained throughout, not Saussure’s). As such, a symbol differs from icons and indexes in that it does not relate to an individual thing, but a type of thing – a general abstraction of an interpretant rather than a specific direct link.

The final triptych, made up of Rhemes, Dicents, and Arguments, identifies the role of the interpretant, and basically defines the mental instantiations that allow for types of representamen to be understood. Rhemes see the sign as being a possibility, and thus reflect the understanding that there are such things as qualities. Similarly, Dicents (or Dicisigns) recognize the instance of something occurring, a sign of actual existence. Lastly, Arguments allow for the potential of purely conventional understanding. The similarities between the types in this final trichotomy to the previous triptychs should be evident, since they are the potential of the mind to recognize the existence of those other breakdowns. For instance, while a representamen might be a Qualisign, Rhemes allow for that quality to be instantiated as an interpretant, just as Arguments allow for legisigns and symbols to be understood through the conceptual understanding of conventionality.

Based on these divisions, signs come as a conglomeration of parts from all three trichotomies. Thus, Peirce identifies ten types of signs, organized here along varying combinations of properties (Buchler 1940: 118):

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![Diagram of Peirce's triptych and ten types of signs](image-url)
By taking Peirce’s whole categorization into account, the complete range of semiotic possibilities can be greatly clarified. Note (in particular for the purposes of this study) that while all symbols are legisigns, not all legisigns are symbols. This means that conventionality does not have to specifically be confined to symbols, but can apply to other sign types as well. Iconic legisigns, for instance, include the smiley face ☺, which is iconic yet conventional at the same time. On the other hand, the pronoun “you” represents an indexical legisign, because it is conventional as a sign in the English language, yet its object of reference is based solely on the context in which it is uttered (Parmentier 1994: 9). For the purposes of this paper, the level of description for types of signs will vary based on the importance of context.

Finally, Peirce acknowledges the existence of mixed signs that have more than one semiotic quality, and insinuates that most signs fall into this realm, wary of the existence of “pure signs” of only one type. Indeed, most of the examples previously described are mixed, such as pronouns, which are indexical to their referents yet are still symbolic in form. In a sense this capacity for mixed signs should be implicit, since these semiotic types express the characteristics of signs’ capacity to convey meaning, rather than formal categories which signs can be slotted into.

2. SEMIOTIC GRADATION OF VISUAL SIGNS

Given the basis of Peirce’s sign types, the most prominent perceptions of visual signs label images as iconic, while written words are perceived as symbolic. In many ways, these semiotic properties can be viewed as polar opposites. On the one hand, icons remain visually similar to their objects, and are therefore presumed to be universally accessible, while on the other hand “arbitrary” symbols require rules to decode them. However, such distinctions may not constitute categories that are as discrete as they may sound, existing instead on a gradated continuum.

2.1 Earlier Continuums
Applied linguist Mario Saraceni (2000, 2003) has argued that written text takes on a position between symbol and icon, depending on how emphasis is placed on its typographical form, such as italics, boldface, or enlarged or reduced lettering. For instance, he claims that italics placed on different words iconically serve as markers for varying intonation (Saraceni 2003:18):

I need to tell you something.
I need to tell you something.
I need to tell you something.
I need to tell you something.
I need to tell you something.

These typographical aspects provide enrichment for the expressive poverty that writing has in conveying prosodic content (Chafe 1994). Likewise, Saraceni claims that this political cartoon (from The Economist by Peter Schrank), would also lie in the center of such a continuum. Here, (iconic) leaky pipes spell out the (symbolic) word “democracy”:

![Image of the political cartoon](image)

However, in these examples, Saraceni seems somewhat uninformed by Peirce’s suggestion that signs can be of mixed types by trying to place them graded between such categories rather than simply allowing for them to be both. The latter example does not

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3 This example is taken directly from Saraceni (2003:19), where no full citation was given, and thus cannot be given here.
seem to sit in any position of gradation so much as it merely combines iconic features with symbolic ones into a mixed sign. That is, the symbolic and iconic aspects operate on two different levels of analysis that can mutually cooperate with each other. On the other hand, the former example with regard to typographical variation can be accounted for by recognizing that while the words are symbolic, they can take on *functionally* iconic features by demonstrating the emphasis.

Saraceni’s also posits that varying representational styles have different degrees of iconic or symbolic value. This argument is basically a rehashing of theorist Scott McCloud’s (1993) categorization of graphic representation into semiotic terms. McCloud proposed that representational styles of drawing can be placed along a continuum of abstraction, from “realistic” to highly simplified (or “cartoony”) depictions, after which the barrier to written language occurs and the association to “reality” becomes completely arbitrary (McCloud 1993: 48):

![Image of a continuum from realistic to symbolic representation]

While it was not McCloud’s overt intention, the associations with Peirce’s semiotics should be quite evident. On one end of the continuum is “realistic” perceptual resemblance while on the other is signification purely by convention. The implication then, is that the more simplified the iconic representation, the more conventional it becomes. Within the realm of iconicity, this is a shift from iconic sinsigns to iconic legisigns, though the shift into conventionality heralds more symbolic representation as a whole (Manning 1998).

By focusing on McCloud’s divide between visual iconicity and writing, this continuum can be fleshed out further. Though McCloud makes a separation fairly clearly, this partition becomes far more graded when incorporating the actual different types of writing systems across the world. In his own continuum between iconic and symbolic

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4 While McCloud is greatly interested in the role of signification and how meaning is made by visual information, his presentation combines it with that of categorizing visual styles. This becomes more evident by moving upwards in his “Big Triangle” toward abstraction into a purely geometric realm of shape and color. A reformulation of the structural aspect of McCloud’s triangle was undertaken in Cohn 2003, while the semiotic aspect will be approached herein.
signs (based wholly on conventionality), Saraceni (2000: 55) ranks Egyptian, Chinese, and Latin along his scale. Here he generalizes the properties of each system as being internally consistent, as opposed to analyzing their varying constituent parts and ordering those along a continuum (which will be the task herein). Again, this sort of approach presumes that writing systems are homogenous in their structure, rather than providing an analysis that accounts for a range of diversity.

While admirable for attempting to tackle the issue of gradation, Saraceni’s lack of knowledge about the actual components of writing systems (especially those apart from alphabets) leads him to over-generalize their placement along a continuum. He falls victim to this with regard to iconic visual systems as well, generalizing a continuum of Photography, Realistic Painting, and Comics onto his scale as sign systems (2000: 59), without considering that these categories do not necessarily denote fixed systems without variability. In contrast, McCloud (1993: 45-53) derives his continuum based on the properties of each sign, and only afterwards analyzes the scale’s semiotic implications. As will be seen throughout this section, writing systems and visual signage cannot simply be slotted into positions along a scale, but occupy broader graded zones based upon the various internal features they employ.

2.2 Writing Systems and Visual Symbols

2.2.1 “Writing Systems”

The common categories of “phonograms,” “logograms,” and “ideograms” can provide a good starting point for fleshing out an analysis of writing systems. Phonographic signs are those that overtly represent sounds, such as the letters in the alphabet. In contrast, ideograms are more “idea based,” most stereotypically exemplified by Chinese characters. It is notable that many of these signs have derived from visual
representations of things that they mean, like these Chinese characters for MOON, TREE, and MOUNTAIN:  

![Chinese characters]

Quite clearly, this progression can fit directly into the continuum of visual semiotic signs, moving from simplistic pictures, into ideograms or logograms (assuming they reflect whole “word” sounds), and then on to phonograms.

However, this is perhaps overly simplistic, and the logographic/phonographic categories very rarely reflect the actual writing systems of the world, which feature both sound and meaning components to varying degrees. Chinese characters are not just representations of “ideas,” and always correspond to sound-based morphemes tied to the various languages that use them, while characters representing one sound are often inserted into composites purely for their phonetic value (Coulmas 1989, DeFrancis 1989). At the same time, glossing them as “logograms” denies the potential iconicity that some of these signs display.

Likewise, “phonographic” writing systems also have a meaning component, across several fields (Coulmas 1989:168-173). For instance, in English, this is apparent in the standardized spellings of words, despite great variance in the intonation of the speech stream. More apparent examples include etymological remnants such as the “silent” letters in the words knife, folk, and wrestle. This is similar to the marking of loan words, like the Greek origins of the “psych” in psychology and psycho, or the “ph” in philistine and philosophy, which index their source language’s orthography. Additionally, homonyms such as there/their/they’re, eye/aye, and bare/bear are spelled to differentiate their semantics, not just to reflect their sounds, which are the same. While English is

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5 To avoid confusion in discussing non-“phonographic” writing systems, I will use **SMALLCAPS** for semantic interpretants of signs, while *italics* will be used for alphabetic representations of the words. For example, the Chinese character “馬,” means HORSE, while is pronounced as *ma.*
particularly heavy with these occurrences, they emerge in other language’s prevalently as
well.

Users of alphabets with an overabundance of these phenomena might pass them off as “bad spellings,” largely due to the perception of the function of writing being an explicit graphical mapping of sound. Prescriptive statements about “spelling” both reflect ignorance that such instances may serve a function, as well as betray the acknowledgement that alphabets do not actually contain such direct correlations. Thus, within different writing systems even more gradation along the continuum is necessary, as each sign has a different allotment of both semantic and sound features.

However it is possible to account for the full gradation of iconic signs and writing. For instance, the middle ground between logograms and simplistic pictures emerges when a sign is used to represent sound in addition to its graphical meaning. On the “image” side of this transference lie several systems, often referred to as “Proto-Writing” (DeFrancis 1985), which contain a small inventory of signs with highly variable interpretative value. For example, the Tibeto-Berman speaking Naxi community in China use visual signs that both stand for the image they represent and the spoken lexical item that corresponds to it. However, the system does not actually represent the Naxi spoken language, rather the iconic signs serve as mnemonic devices for sacred texts, leaving out many of the spoken words in their corresponding sentences (Rock 1947, Anshi 1998). Similar mnemonic signs emerged in various Native American tribes. For instance, Ojibwa shamans in Minnesota used mnemonic pictographs for chanting, and features of the bookkeeping system of the Passamaquoddy division of the Abnaki tribe from Maine also employ iconic signs that link to spoken words while not representing their oral language in full (Mallery 1893). Also, just as no actual writing system is purely sound or meaning based, it should be noted that these systems employ additional methods of visual/transcriptive signage as well – a point which will be addressed in this section.

Historically, mnemonic usage of graphical signs has often been followed by a rebus, in which the sound used to correspond to the representation of an object is then extended for use in other contexts of that sound. A hypothetical parity can be made with English; if one were to use the sign ♠ for the word man and □ for date, those signs would be used as rebuses if combined to make the word mandate as “♠ □” (Coulmas
1989:60). The rebus principle emerges quite prevalently in modern English with Internet shorthand and on license plates, often using numbers or letter names for their phonetic value only, for instance “R u 2 l8 2 eat b4 going 2 the pRT?”

The rebus marks a pivotal point where visual signs become extended for the purposes of sound representation, taking on greater indexical properties as iconic signs begin to be correlated with increasingly symbolic forms. However, rebus formation should not be viewed in any sort of “evolutionary progress” sense of ranked value. Rather, the indexical correlation of the rebus is merely the process which visual representation has undergone with regard to the transference of signification across modalities – mapping the aural to the visual. This becomes especially salient because rebus usage does not immediately follow mnemonic signs along the continuum, since they contain no features that reflect on the semantics of their roots. As will be elaborated on later, the rebus enters at the furthest point along this continuum since its strips the sign of its semantic features altogether, deriving all meaning through the association that those sounds have with speech.

However, it is mentioned here because the rebus use of signs does factor into the next positions along the gradation between semantic and sound-based signs.

Following mnemonic signs, the transition to what are generally called “logograms” occurs. However, this category alone is more graded than it appears. First, this would include signs derived from iconic roots, such as the Chinese characters МИ for MOUNTAIN and 月 for MOON discussed previously. These signs begin at the mnemonic category, extending through to become used freely as rebuses, and then incorporating into other characters. For instance, the next step over includes signs that have a dominant semantic component with a subordinate phonological component. Boodberg (1937:343) cites the example of the Chinese character 目 used to represent EYE (derived from an iconic eye turned sideways), which was supplemented with the more appropriately
sound-based phonetic determinative 兇 below it, to become 見 – TO SEE. DeFrancis (1989) identifies these as “PS” signs, where the (P)honetic component modifies the (S)emantic component. Note that already at this point, signs retain only a cursory level of iconicity if at all – both wholly and in part. DeFrancis similarly identifies “SP” or “morphosyllabic” signs, which would be the next step over on the continuum. Here, a semantic component gets added to an otherwise dominantly phonographic sign. For instance, the Chinese character used to depict MOTHER (mâ), 媽, employs the phonetic ma of HORSE, 馬, while adding the semantic character 女 for FEMALE (DeFrancis 1989:98).

This brings the gradation to look like this:

A related phenomenon occurs as the gradation into “phonographic” depiction is reached, with use of semantically determinative sign combinations within the broadly “sound representing” system. This begins with larger increments, such as the previously discussed homophones there, their, and they’re, while moving into smaller increments like the psych in psychology since only a that part of the word is semantically representative. In this case psych references a Greek root, yet knowledge of these etymological origins are not necessary to distinguish the morphological meaning that the bundle of letters psych continuously represents. While these “abnormal spellings” might allow for some capacity of speech mapping, they by and large serve as morphological phonograms – essentially a second PS type dominated by the (P)honetic rather than (S)emantic component.

Following this the move to “purely” phonographic signs occurs, where individual graphemes depict isolated sounds. It is this position that the rebus falls, since it is composed of signs that contain a sound mapping devoid of semantic features. Such a semiotic mapping of the rebus illustrates the dramatic nature of the move to mapping sound with graphical representation, since it pushes the sign all the way to the edge of the continuum where it abandons its semantic features altogether. Conjunctive signs can then
be understood as a retreat back to the semantics of iconicity which simultaneously mediates the phonemic power brought by the extreme of the rebus. Rebus usage can vary depending on the language. For instance, they could be used to represent sounds as large as whole words, as in Naxi (Rock 1947), or as small as individual phonemes, as in the case of consonants in Egyptian (Ritner 1996: 74). Since the continuum being developed here is only concerned with balancing semantics and sound, at this extreme, no distinction is made for the number of sounds that may map onto an individual visual sign. It could be one sound (as idealized by alphabets), or many (as in many syllaberies), and it may even require sign conjunction to create a single sound (as in t + h for \( th \) in English spelling). The continuum now looks as follows:

![Diagram](image.png)

Since the furthest point along this gradation results in a representation of sound-based phenomena, it has absolutely no semantic bearing whatsoever. Here are placed “purely” phonographic signs, most exemplified by those used in the International Phonetic Alphabet used by linguists. No fossilized graphic forms exist to create any meaningful units, only a transcription of sounds. The creation of meaning by these signs requires two steps then: 1) the association of graphic signs to sound and 2) the relation of sounds to meaning from speech.

While this gradation might seem to adequately express the growth from iconic representation to a sound-based representational system, it does not yet fully encapsulate all the necessary components of writing systems. To do so, an additional point must be added to create a triangle, with the previously described gradation occupying only the bottom Iconic to Sound-Based edge. The other point is that of abstract semantic representation that has no sound value or iconicity, depicted very simply here:
This will be referred to as the “Abstract” point, though such a label should only be understood as a *reductive* definition, referring to graphic signs that lack either of the qualities of the other two points. In other words, at the highest point of abstraction, these signs are both arbitrary and not connected to sound. These signs would be pure “ideograms,” such as a heart: ©, or peace sign: ☞. This will be returned to as we turn to discuss the triangle as a whole.

### 2.2.2 Abstract Writing and Visual Symbols

Taking this additional point in mind, we can now address the placement of numbers in the array. The most commonly used Arabic numbering system of 1, 2, 3… falls on the far right edge of triangle directly between the abstract and sound-based corners. While it represents abstract representation without any sort of iconicity, it still has the potential for sound-based mappings per language they become used by. These signs do not *require* associations to speech all the time, especially in the case of complex math equations where they can be read for the concept they represent, regardless of how they are pronounced. In contrast to Arabic numbers, at least the first three numbers of the Chinese system are somewhat iconic: 一, 二, 三, landing on the center of the triangle near the area above the mnemonic signs that are read according to their iconic representation. Next to this would be the older Chinese signs for *up* and *down*, which depict those concepts with some iconicity: 上 and 下. However, just as more “perceptual” iconic signs grew more symbolic, these did too, resulting in 上 and 下. These signs do not retain
as much iconicity as their origins, and thus move further towards the abstract edge of the triangle.

They do not lose or gain any more sound value though, and thus don’t move any more towards the sound-based edge. Again, the move towards abstraction has no bearing on the semantic abstraction of the concept, only the abstraction of the visual sign away from iconicity or sound representation.

Similarly, composite signs made of semantic signs can be placed above PS signs. For instance, the character 好 meaning GOOD is made from the iconically derived signs for FEMALE, 女, and CHILD, 子. This sort of semantic-semantic (SS) compound creates an abstracted sign out of two iconically derived signs. This is furthered by Japanese kokuji, invented to represent Japanese words using compound Chinese characters. Other SS combinations are 勤 meaning EFFORT, made from PERSON, 人, and MOVE, 動, and the visually iconic 峠 meaning MOUNTAIN PASS, made by combining mountain, 山, with UP, 上, and DOWN, 下, which create a visual “pass” between them (all examples from Sproat 2000:156-158). However, not to be misunderstood, although there is not an overt phonetic component, such characters do map to specific sounds in their respective systems, and thus remain mapped on the lower half of the triangle.

Various “logograms” also can map slightly above the far sound-based point when they are devoid of semantic features. These conjunctive signs are used only for their
sound value, and retain no semantic traces. An example of this would be the modern characters 珈琲, pronounced kouhii when used in Japan for coffee. The first character kou (ORNAMENTAL HARPIN) combines with hii (STRING OF MAY PEARLS) for purely phonological purposes (Sproat 2000:159). These signs are similar to the rebus, though here the phonetic components may be overt within the compound, and do not rely on the extending mnemonic sounds based on iconicity.

On the upper half of the triangle, visual signs have no sound correlation at all. Just as a gradation can be mapped from iconic signs to symbolic sound-based signs, a continuum from iconic to purely visual symbolic signs along the upper edge exists as well. After the simplified iconic stage come iconic signs which feature symbolic meaning that is correlated to the iconicity. For instance, the skull-and-crossbones often used to represent DEATH or DANGER.

This stage can be considered as the equivalent to the rebus principle on the iconic-sound edge of the triangle. Here, visual signs begin correlating beyond their iconic meaning to extend into other symbolic meanings.

Next up toward the Abstract point are iconic signs that have a symbolic meaning that is only partially derived from the iconicity. A good example would be the image of a stork carrying a baby used to signify PREGNANCY.

Here, while the baby does correlate to a notion of pregnancy and birth, the stork does not directly. In stories, the stork has been related to birth by delivering a newborn to its parents, though this association is made indexically. This stage of development can be

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6 Sproat (2000:159) also astutely points out that while it has taken on a rich semantic quality, the first use of Chinese characters in Japan took on this nearly total phonological characteristic with the ateji of the early Japanese manyou’gana.
likened to the PS and SP compound stages of the iconicity-sound continuum, where parts of the sign are related to either end of the continuum.

Moving further upward are iconic signs with symbolic meanings that have no relationship to their iconicity. For instance, the widely used image of a dove represents PEACE.

![Dove Image]

This sign has no direct iconic correlation to the concept of PEACE, only those conventionally acquired. While the dove is not a bird of prey and thus might seem ideal for such meaning, the conventional association to PEACE dates back to the story of Noah in the Bible (Genesis 8:10-12). Of course, an interpretant would almost never insist that this sign was not a dove – which is undeniably true – though its employment in various contexts insinuates the meaning of PEACE as beyond just its iconic meaning. Take for instance, a peace rally with doves on billboards. These signs do not mean DOVES the animals, but only refer to the sign’s symbolic meaning.

Also take the example of the signs of people ♂ ♂ used for restrooms. On individual doors or walls, these signs iconically represent which room is designated for the gender of the sign depicted (though they retain elements conforming to Western conventions of dress). However, when the two images are used together, they symbolize the presence of bathrooms in general (often used in contexts such as on hanging signs to indicate where to find the actual rooms). This symbolic extension may derive from the meaning behind the individual signs, but no longer relies on the iconic meaning.

Another example would be the fish used to represent Christianity: ﬁsh. While this sign might attribute its origins to iconic roots, its current meaning represents the Christian faith as a whole while still standing at least somewhat as an iconic fish. Most likely, many symbolic visual signs owe their roots to iconic origins and lose them over time, just as symbolic gestures often trace back to iconic ones. For instance, the practice of crossing fingers for luck derives from making a Christian cross (Clark 1996: 164). However, while this type of development is available to visual signs, it is not available to auditory ones. Contrary to the myriad explanations that give iconic roots to spoken words (e.g. Müller 1864: 64), no evidence suggests any sort of validity to the claims, especially
in light of the complex processes required for symbolic expression (Parmentier 1994, Deacon 1997). Indeed, even onomatopoeia in language requires at least some degree of conventionality tied directly to the language in use.

The penultimate step in this continuum from iconic to abstract contains visual symbolic signs that exhibit iconicity that relates only to the symbolic meaning of the visual sign. An example of a sign like this would be the yin-yang symbol ☯, which is a visually symbolic sign that has symbolic meaning. However, its visual characteristics are iconic only for its symbolic meaning: the seamless continuity between the light and dark “fish” of the sign demonstrates the never-ending interpenetrating cycle between any set of opposing conceptions, thereby showing the meaning behind the yin-yang. Essentially, where in the previous signs the iconicity is visually apparent to the symbolic meaning, here, the symbolic meaning guides the iconic representation.

The upper point of the triangle holds visual symbolic signs with neither iconicity nor sound correlation. As mentioned above, these include hearts for love, peace signs ☮ for peace, and many others. The representation of these signs is completely arbitrary to their meaning. Granted, these signs can become substituted into written language to supplant the words correlated to their meaning, for example “I Chicago.” However, such usage is not primary to the visual sign. The sign can represent both the concept of love or the word love, and thus through this semantic association substitution like this becomes possible. This results in a variable type of reading, allowing the 2004 movie I Huckabees to be pronounced “I heart Huckabees.” However, it has taken on the sense of heart as well, and can thus be substituted onto the chests of drawings of iconic human figures.

Often, though signs at this Abstract tip are arbitrary with regard to their object of signification, readers might imbue them with stories to justify some sort of iconicity. For instance, the symbol has been justified as iconically representing the human heart organ, which somehow relates it to the concept of love (perhaps through its accelerated beating when excited). However, its origins have been traced to the seed of the silphium plant from Cyrene, which was used as a contraceptive in ancient times and by way of Egypt became associated to notions of love (Favorito and Baty 1995). Similar iconic meanings have been attributed to the peace symbol, such as the shape of an bomber plane
or the footprint of a dove, though the sign emerged in 1958 from a British activist who combined the shape of the semaphore letters of N and D within a circle to reflect the “Nuclear and Disarmament” movement (Liungman 1991: 253). While this origin might be iconic (to symbolic referents), it in no way seems to reflect the general understanding of the sign as a symbol for PEACE synchronically.

Finally, tracing down along the far right side of the triangle on the upper half between two edges can be identified as marking symbolic signs with “sound correlating affects.” This would include signs such as question marks ?, ¿ and exclamation marks !, ¡. Such signs bear semantic meaning and mark pragmatic or intonation affects on the written utterance, though they do not actually represent sound themselves. Thus, they belong on the upper “non-sound-based” half of the triangle, though not pushed to the extreme because of their sound manipulating effects.

The resulting whole triangle can be deemed the *Cognitive Map of Graphic Signs* (CMGS) looks like this:
Note that when completed, the shape of the gradation is not a smooth “triangle,” as the iconic representation forms a “shelf.” This is because representation is in no way determined to travel from being “realistic” to sound-based. The shift towards sound association only occurs after a certain degree of simplicity has been reached with the iconic representation. Furthermore, multiple threads travel each of the iconic representations on the shelf converging towards the Abstract point. Labeled as “Representational Variability,” these lines show that the shift from Iconic to Abstract signs allows for multiple types of iconic “style.” That is, a skull-and-crossbones or a dove can still be drawn in either “cartoony” or “realistic” styles. However, a yin-yang or peace sign cannot allow this sort of variance, hence the converging of the lines at that upper point.

One final feature of the CMGS’s categorization of writing systems should be mentioned. As mentioned at the outset, this scale does not reflect the variation encompassed by the various orthographies in the world with regards to graphically depicting sound. However, this scale does not need to as it is presently depicted. The purpose of this mapping system is to create a cognitive space to reflect the relationship of semantics and sound in graphic systems, allowing the bottom-most part of the triangle to cover a fair amount of diversity in its scope. Therefore, the differences between alphabetic, consonantal, and syllabic systems does not need to be expressed throughout the triangle. These forms are equal in their capacity to portray sounds, though the systems that employ them might alter the quantity of sound per grapheme and the semantic value that they take on. In this way, commentary in the literature focusing on these distinctions still stands unchanged. Included in this list would also be “featural” systems, such as the Korean Hankul (Sampson 1985). While many Hankul signs are iconic of their oral point of articulation (Ross 1996: 220), this type of iconicity does not have any bearing on semantics; they still represent units of sound as opposed to units of meaning.

2.2.3 A Note on Processing

While the triangle does provide a rough categorization system for graphic signs, it should not be interpreted as a device for rigid taxonomic distinctions. Thus, despite the
above placement of signs into different places along the triangle, such positions are not absolute for specific signs. Because the triangle represents a “cognitive map” – reflecting the various understandings that the mind makes of graphic signs – the placement on different parts of the triangle can differ per individual and per sign. For instance, if a person cannot read Chinese, but is told that a certain character means something, that sign enters the triangle at the top point because it does not map to any phonemic features. Another good example would be the “heart” symbol, which, though discussed above as a purely symbolic sign, can actually map to various parts of the triangle based on its usage. When used solely as a symbol for LOVE, say with an arrow penetrating it, then it maps to the Abstract point, though if inserted into a sentence for phonemic qualities, as in “That was some y soup!” it serves as a rebus at the Sound-Based point. Most likely though, the heart is recognized with its semantic qualities, though with a weak phonemic “name.” It thereby takes a rank similar to numbers, which are symbolic signs with non-overt sound correlations and lie on the far edge of the triangle directly between the upper and lower points. Furthermore, a weak mapping to the haplotic icon area can be made when individuals think consciously that the heart symbol is supposed to resemble the actual human organ – though no such iconicity actually exists. Possible placements of the heart symbol in the CMGS are:

Thus, the triangle reflects a cognitive map for understanding graphic signs, not an absolute system of categorization. Symbols like the heart do not fall neatly into a categorical space to be bound to one position. While loose categorization can occur (such as those implied in the discussion to establish the triangle), as a theoretical cognitive map, the triangle must reflect how knowledge of individual speakers ties to the context of the
signs they engage with, and psychological experimentation could aid in verifying such understandings. This is a theme that will recur throughout later sections.

3. WRITING SYSTEMS OF THE WORLD AND THE CMGS

Richard Sproat (2002) has developed a computational approach to writing systems, placing all phonographic systems along a singular axis, from which extends another dimension showing the degree of logography that they depict (further revised in Rogers 2005). Sproat’s approach breaks stride with arboreal models such as Gelb (1963), DeFrancis (1989) and others have created. This biaxial taxonomy works well to complement the triangle in expressing the richness of different types of writing systems’ phonographic component in concert with logographic features (Sproat 2000:142, Figure 4.5):

With the logographic axis, Sproat attempts to express the semantic variety found in the orthographies of the world, yet falls victim to maintaining each system as a homogenous type without defining the character of the logography. This axis can be replaced by the triangle. In that each type of phonography can be inserted into the sound-based categories of the CMGS, Sproat’s top axis could easily cross-cut the triangle’s baseline, creating more of a pyramidal cognitive space, as opposed to the two
dimensional plane discussed here. To keep the present endeavor focused on the semiotic qualities of visual signs, detailed elaboration on this point will be refrained from, though it is acknowledged to be an essential part of characterizing different writing systems. I leave the integration of this phonographic axis with the triangle to future research.

While Sproat’s analysis works well to show contrasting writing systems, this, of course, leads to a good question: how can individual writing systems be expressed in the triangle?

First off, the CMGS is built to show a gradation of types of visual signs. As such, it should be recognizable that the triangle makes no appeals to broad generalizations such as “logograms” or “phonograms” in any real sense. Rather, these are merely prototypical points for categories that have become applied to different groupings of signs that share common characteristics. Roughly, these notions fall around points of the triangle illustrated here:

![Diagram of the CMGS showing gradation of visual signs]

While it may remain useful to keep using the terms “logogram,” “ideogram,” and “phonogram” for communicative purposes and general analysis, the CMGS should highlight the inadequacies and misleading assumptions that such definitions place on classifications of writing. Though not offered here, a revision of technical vocabulary could both be a good and bad thing. Naturally, jargon would allow for easier communication and classification, however, on the downside it would imply an explicit categorization of signs as opposed to a graded position along a continuum.

As mentioned previously, hardly any system of writing is constrained to a single point on the map. Thus, categorization of different systems will fall across different
topological space within the triangle. Furthermore, since the essence of the triangle represents cognitive space and not rigid taxonomic positions, any charting of systems reflects tendencies based on properties of the signs. We now turn to illustrate how a small sample of the world’s orthographies might map in the CMGS.

3.1 English

As discussed previously, the “purity” of alphabetic writing is somewhat contestable. Though in principle alphabets can allow for a one to one mapping of sound and graphic sign, such precision is only an ideal. Nowhere is this more evident than in English. The mapping of English in the triangle falls roughly like this:

English takes up a marginal area at the bottom of the triangle, reflecting its high sound-based characteristics. As has been discussed, it does not just fall to one pinpointed spot of “purely” sound-based signs, but contains a degree of semantics and also aligns with morphologically distinct combinations of signs.

3.2 Chinese

Chinese is often considered the paradigmatic example of an “ideographic” or “logographic” language, which has led some researchers to lash back by stressing its high sound correlative values. This claim has been most strongly made by DeFrancis (1989) who stresses that the vast majority of Chinese signs are of conjunctive semantic-phonetic
combinations. Emerging no later than 2000 B.C. (Boltz 1996), modern Chinese writing covers a large area of the lower section of the triangle, including mnemonic signs of the iconic and abstractly iconic types, rebuses, as well as most all types of conjunctive signs. The resultant mapping of Chinese on the CMGS appears as follows:

Most distinctly, Chinese takes up a great deal of cognitive space in comparison to English, and, like Egyptian (to be addressed further down), it retains its positioning on the lower part of the triangle, contrary to many popular misconceptions. It extends throughout most of the lower section of semantic and phonetic compounds of various types, along with mnemonic and rebus signs. However, what is missing from this mapping is an indication of percentages of sign distribution into different fields. One of the most significant aspects contributing to the claim that Chinese is more phonemic than previously supposed is that out of the 48,641 characters in use by the 18th century, 97% of them were of the conjunctive semantic-phonemic type (DeFrancis 1989: 99). Though not done here, such percentages could be incorporated into the triangle graphically with different coloring of the topological space to distinguish quantities of certain types of signs in a single system, thereby indicating a more accurate character of the system as a whole in comparison to those that map similarly.

3.3 Japanese

The Japanese writing system is arguably the most complex in the world; it employs four separate scripts concurrently. In addition to a western alphabet (termed
romanji), hiragana and katakana syllaberies (together known as kana) represent vowels and ordered consonant vowel pairs of the same sets of sounds, yet their social usage is different. In modern times, hiragana is used for native Japanese words, while katakana is used for loan words, onomatopoeia, and for typographical emphasis (Smith 1996: 210-212). Kana are wholly sound-based, and thus fall near the end of the sound-based point of the triangle.

In addition to these syllaberies, Chinese characters, or kanji, have been used since before the 700s A.D. (Coulmas 1989). Following their importation, these characters were the sole system used, however, their poor fit to the spoken language prompted the development of hiragana and katakana by simplifying various kanji for their sound values only. Most kanji used in Japan have been slightly simplified from their Chinese counterparts, along with the creation of new kanji, or kokuji. Each kanji has at least two readings, one for a native Japanese word (kun-reading), and one for an imported Chinese pronunciation (on-reading). Characters often become combined in polymorphic words (Smith 1996: 209). The primary Japanese scripts appears like this (multi-toned to distinguish kana from kanji):

Of particular interest here is just how large a space the Japanese system occupies, reflecting the high degree of logography attributed to it in Sproat’s (2001) model. Like Chinese characters, kanji are distributed across many sections of the middle part of the triangle. However unlike the high phonemic mappings of Chinese, out of the over 2,000 kanji in general use, no more than 25% contain clues to their phonological readings (Paradis et al. 1985: 11), again insinuating that graded shading could lend even more
insight into how systems contrast with each other. In addition to the central location, kanji also extend into the lower edge as well for rebus type signs. The whole kana system extends down into the lower edge as well, though lacking morphological phonograms. Given the rest of the mapping, this should come as no surprise though, since the conjunction of sound units into meaningful parts would be unnecessary with an additional system as robust for semantic influence as kanji. Additionally, it should be noted that in the writing of young people various symbols such as ＄ or ☹ are used (Satake 1990: 2), as well as the smiling face ^_^, expanding the mapping of Japanese visual signs into the non-sound regions of the CMGS (not mapped here).

3.4 Egyptian Hieroglyphics

The most famously “pictographic” writing system is Egyptian Hieroglyphics, which combines mnemonic and rebus signs. Though Egyptian writing used four scripts over a period of roughly four thousand years, many of which were used in conjunction with each other, this discussion will focus primarily on Hieroglyphics because of the long-standing misperceptions believing them to be purely semantic (Coulmas 1989). Though there is a fair amount of “meaning only” signs (semograms), most Hieroglyphs represent skeletons of consonants into which the readers would fill in the vowels (Ritner 1996: 74).

First, Hieroglyphics used mnemonic and rebus signs, many of which are highly iconic or represent symbolic meanings. These base forms can combine to form conjunctive Phonetic-Semantic signs to represent correlated semantic notions, such as putting -msdr for EAR with the rebus  for the sound m, creates  sdm for HEAR. Also within the inventory of signs are “determinatives,” which are added onto homophonous words to distinguish their meanings – essentially creating “SP” compound signs where semantic elements are added to the primary phonetic component. For example, to the sound-based sign  of the homophones ss, the addition of a “book-roll” creates WRITING while adding a seated man  creates SCRIBE (Ritner 1996: 74).
74-76). The sound-based sign remains the same and arbitrary between the homophones, while the determinatives specify the meaning of the word. Some determinatives have fairly abstract semantics, with iconic roots correlating to symbolic meanings. Because these signs individually have no sound mapping, they can fall on the upper half of the triangle. Over time, these conjunctive signs lost their linear juxtaposition to become more compositionally truncated, either for aesthetic harmony or “magical” considerations related to the signs (Ritner 1993: 163-67). Egyptian also uses phonograms that vary based on the number of consonants represented by each sign (Ritner 1996: 74). Because such distinctions are superfluous for semiosis, they all map to the bottom corner of the sound-based edge.

Thus, the system of Egyptian Hieroglyphics occupies a cognitive space in a fairly distinct area of the CMGS:

![Diagram of Egyptian Hieroglyphics in a cognitive space]

Though confined mainly to the lower edge, Egyptian Hieroglyphics have some fairly distinct features to its mapping. Unlike Japanese *kanji*, the use of conjunctive signs does not extend out into the middle sections of the lower area because the signs all contain explicit sound correlations. There are no compounds based wholly on semantics. Additionally, Hieroglyphics are more transparently iconic than mnemonic *kanji*, indicated by the greater mapping into the iconic shelf. Finally, with the addition of abstract determinatives Egyptian Hieroglyphics extends to a confined position on the upper edge.
3.4 Naxi

Another system using “pictographs” comes from the Naxi system. While not popularly known like the other examples, it will provide another illustration of variation in the activation of space in the triangle. This Tibeto-Berman speaking community in China consistently uses mnemonic signs for concrete ideas, while also employing the rebus principle in their sacred texts. According to Rock (1947:77), the Naxi cannot express abstract ideas using pictographs, “therefore symbols representing concrete ideas are employed or borrowed, which have the same tone value and sound complex as the abstract word.” It remains an iconically expressive system while not fully embracing sound correlation to all its signs, as many are aural words and have no visual correlation at all (Rock 1947, Anshi 1998). Note this example, with the translation and glosses given by Rock (1947: 79):

\[
\begin{array}{c}
\text{Ndsherêr-} \\
\text{DEW}
\end{array}
\begin{array}{c}
\text{lv-} \\
\text{HOT}
\end{array}
\begin{array}{c}
\text{ch’wua-} \\
\text{SIX}
\end{array}
\begin{array}{c}
\text{t’o-} \\
\text{A DROP}
\end{array}
\begin{array}{c}
\text{gv} \\
\text{CAME FORTH}
\end{array}
\]

“From the hot dew came forth six drops”

The upper signs represent dewdrops with haplotic iconicity, while the lower left grouping represents rocks, which are used as a rebus for HOT. The rightmost sign is of an egg, meaning TO COME FORTH (note the metaphoric extension for the visual signage). Finally, in the center, there are six lines coming from the second dewdrop. In this one “sentence” we see multiple types of sign usage. First, the dewdrops are iconic, while the number system is abstractly iconic. Interestingly though, the numbering of drops is kept separate from the representation of the drop itself. That is, it doesn’t have an image of six drops (as an iconic grammar would), but keeps the concepts separate as in the aural morphology. Also notable is that the same signs are used for the mass noun of DEW and the count noun of DROP, which correlate to different words. Meanwhile, the sign of the rocks is used only as a rebus, borrowing its phonetic value. Furthermore, similar compositions are upheld for both the modifiers SIX and HOT, lying below their modified
nouns. So, we can chart the Naxi system as very generally occupying the central and far areas of the bottom of the CMGS:

This topology conveys that the Naxi system uses highly haplotic icons with mnemonic and rebus sound mapping. It remains constrained fairly tightly in the area of the triangle on the cusp of the iconic and sound mapping border, though with a far leap to the sound point for rebus mapping at a whole word level. No mediation between these extremes has been made in any form of conjunctive signs, and thus no development of smaller units of sound either.

3.5 Blissymbolics and Universal Writing Systems

Since the previous sections discussed the placement of actual orthographic systems on the triangle, a brief discussion should be made of attempts at the creation of international symbolic writing systems. In the face of the rapid globalization of the past century, a growing desire for a *lingua franca* in graphical form has been pushed to make up for the boundaries between people faced in speech. The most widespread of these systems is Blissymbolics, developed by Charles Bliss in the middle part of the 20th century (Bliss 1965). His intention was to create a writing system that could be adapted to any spoken language, though in practical usage it became adopted by disabled and mentally handicapped individuals (Rogers 2005). Blissymbolics use a variety of different sign types, ranging from mnemonic and abstract pictograms to arbitrary symbols such as house △, protection ⚔, or mind ⚭. It also allows for compounds, but only those of semantic types. For instance, cloud ☁ is created by combining sky ___ with water ___.
and taxi is created by combining car with limited time (Rogers 2005: 264).

Finally, certain marks are used only for notation of grammatical significance, such as plurals, tense, and number. Unlike semantic determinatives in Egyptian, these signs are wholly symbolic though only with the potential for sound affecting qualities, and thus rank amongst signs like question and exclamation marks. The resulting space in the map appears as follows:

![Blissymbolics Map]

The most notable aspect of this mapping is how different it is from the previous systems discussed in that it primarily occupies the central part of the triangle. This is particularly telling because it supports the system’s desire for a high degree of semantics, though it also betrays the inseparability of Blissymbolics from sound correlation. It always requires mapping to a spoken language in order to be understood, and thus syntactically mimics whatever language it is being used to represent. To these ends, it partially succeeds as a potentially international writing system, though suffers when faced with broad scale diversity between languages, for example syntactic word order.

Furthermore, in that Blissymbolics always has a sound component, it still falls short of being a wholly symbolic system devoid of speech mapping features – that is, a system that lies only at the upper point of the triangle. For all indication, there is no possibility that such a system could possibly exist, despite the continual desires to create artificial systems of this type (Sampson 1985). These attempts represent the intuition for placing the graphic domain in some central place with regard to human’s conceptual

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7 See for instance, the “Elephant’s Memory” system online at: http://www.khm.de/~timot/ (accessed 4/5/05)
expression, though contending with the myths that all languages must be symbolic (discussed earlier with the discussion of language’s indexical and iconic features) and that visual communication is somehow universal. However, it does not take into account that a natural grammar might already exist for such a visual form, and that it too might be culturally variable (McCloud 1993, Cohn 2003).

While often noble in their intent for bridging communicative gaps found in a rapidly globalizing world, these endeavors most likely stem from an orientalist misunderstanding by people from “phonographic” systems concerning “logographic” systems. This belief perpetuates the notion that systems such as Chinese characters represent “ideas” dissociated from any sort of sound relation, which are featured so prominently in alphabets. This view has been further exaggerated because of the rigid categories implying a binary opposition between “idea-based” and “sound-based” representation without gradation.

Note, also, that no naturally occurring systems use sets of signs from the upper edge of the triangle in bulk. Iconic representational systems such as those in comic books employ signs from the iconic section quite prominently, and writing systems use most of the lower sound-based section. However, no large set of symbolic visual signs exists as an inclusive system of communication (much less occurring naturally). By and large, signs of these types become supplemental to the other types of signs in the triangle – such as the use of the heart symbol in written sentences or iconic representations. Outside of these productive uses, abstract signs usually only fall in specific social contexts such as “icons” in computer programs or signs in airports, which do not constitute a “system” as a whole, only isolated uses of graphic signs for varying contexts.

While visual symbols might be prevalent as tokens, even more telling is that there is no established syntax that they engage in for sequential expression that combines signs into greater expressions. In other words, there is no naturally occurring language of visual symbolic signs because 1) there have been no inclusive sets of symbolic visual signs which would comprise a lexicon and 2) such signs that do exist do not have a syntax that orders elements together and that is acquired by children along a developmental trajectory. In light of the poverty of a naturally occurring visual symbolic
language, the creation of an effective “universal” symbol system for communication devoid of sound correlation is doubtful.

3.6 Summary

In sum, most all systems of visual signage employ properties beyond the established prototypical categorizations, therefore these signs permeate throughout multiple positions ranging between iconic and symbolic visual representation. While the particular cultural examples given here have been characterized by synchronic divisions, the triangle could also be used for diachronic comparison, showing how a visual sign system has changed over time, or with contact with a new aural language. Additionally, it was also pointed out that no “writing system” can exist as detached from a spoken correlate, and thus the attempts at universal or non-aurally based writing systems cannot work. If a natural language were to exist in the graphic domain, it would require its own grammatical structures unattached to those of the verbal modality.

4. INTERPRETING THE COGNITIVE MAP

4.1 Structural

The triangle as a whole reflects a number of distinct characteristics. The most evident of these should be the gradation of graphic to sound correlating signs, as illustrated by the line bisecting the triangle here:
Cognitively, this line reflects the manner or degree of transference of the aural modality onto visual structures. Or, in the sense of an aural grammar, how much the phonemic values connect to “photological” structures; that is, mental structures that organize the visual information composing graphic signs into recognizable and meaningful wholes. The aspect of literacy is often overlooked in discussions of grammatical models, yet in a literate mind any lexical entry must have photological features in addition to the commonly accepted values of morphology, phonology, etc. Evidence for this comes from the existence of items such as acronyms, e.g. NATO or USA which create words out of the alphabetic understanding of the first letter of their spellings, and metalingual speech acts, such as a professor’s utterance, “…that is ‘reference’ with a ‘ce’ not ‘ts.’” In Japan this emerges in the question on first acquaintances of asking which kanji comprise the sounds of one’s name (in casual settings usually. In more formal occasions this is often satisfied silently in a ritual of business-card exchange). Furthermore, in that photologic structures effect the conceptualization of language, they also have had an impact on the analysis of language. Modern linguistic theories often choose units of analysis such as “words” and “sentences,” which are artifacts resulting from the practices of writing itself and only tenuously reflect oral utterances (Coulmas 1989, Chafe 1994). If a complete grammar of even aural language is to be understood, it must include a photological component to account for these types of conceptualizations.8

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8 Incorporating a photological structure into the grammar would also usher in the possibility of a purely visual modality of language. This could perhaps best be accomplished by a parallel model of grammar of the sort proposed by Jackendoff (2002), which distributes the lexicon across the various structures of language. Doing so, it allows those lexical entries to be potentially devoid of one structure or another. This
The most distinct and voluminous graded oppositions in interpreting the CMGS come from the Iconic point towards the Abstract-Sound-based edge (which is why the triangle is graphically oriented to highlight this line). Most apparently, its semiotic properties emerge as a continuum of iconic to symbolic representation:

![Diagram](image)

The whole right edge of the triangle exhibits symbolic representations, divided by the degree to which those signs are mapped to specific sounds. Around the middle areas of each edge lie indexical sections, because correlations between edges begins to occur in these areas. For the iconic-sound edge, this indexical relation falls to the mnemonic and rebus signs, while the iconic-abstract edge does so with iconic signs with a correlative symbolic meaning.

![Diagram](image)

Thus, this vector represents a projection of conventionality, from iconic to indexical to symbolic representation. Within the fully iconic “shelf” a mixing of sinsign and legisign would allow musical notation to occupy a lexical entry that is devoid of a conceptual structure, though is capable of entering into syntax (Lerdahl and Jackendoff 1983). Meanwhile, iconic signs could be devoid of phonological structures, yet enter into their own syntax (Cohn 2003).
representation is allowed, though after a certain point it gives way entirely to properties of legisigns. That is, elements to the far Iconic point only appear as single instances of representations, while those approaching the end of the shelf become more regularized as they become simpler (such as the smiley face 😊 or stick figures). This also implies that such movement is between perceptually based representations and those that exist in conception only. That is, iconic signs by definition resemble their objects of reference and are thus grounded in perceptual similarity, while the source reference for symbols exists in mental space alone. By lessening the amount of iconicity, signs shift more toward a grounding in conception rather than perception.

Additionally, symbolic signs are fairly arbitrary in contrast to the iconic signs. As such, all sound-based signs have the potential to gravitate toward the Abstract point of the triangle depending on the familiarity with the signs that a decoder has. Because the correlation of a visual sign with sound demands conventionality, for those unfamiliar with the writing system from which a sign comes, the visual representation simply becomes an arbitrary jumble of lines. In this state, it does not belong to any part of the triangle, because it is not a sign for something. However, if told, for instance, that the jumble of lines depicts some sort of concept without teaching the corresponding aural word, that sign then emerges in the abstract corner of the triangle. While such a reader might not have any familiarity with the phonographic aspects of that system, they can still associate those signs to a meaning. For example, Americans commonly get tattoos of Chinese characters, understanding that they mean something. For them, these signs do not represent the words in Chinese, only the meanings. Through further learning, such a sign could then move down towards the sound-based side of the triangle. As discussed earlier, just as the gradation from one section to another implies, the triangle is not a fixed and rigid categorizing tool. Rather, it reflects the cognitive capability for recognizing visual signs, which might vary to suit the contexts of an individual’s knowledge.

---

9 This phenomenon could have led to the perception that logograms are somehow ideograms –unattached from phonographic qualities –that people of phonographic systems have held of logographic systems. That is, they perceive it as more “idea representing” because they do not understand the system by which those signs exhibit correlation to speech and thus bypass that step in the conceptual entailment. For them, the signs do occupy the upper parts of the triangle, because they do not understand the systems that would push them to the lower part of the triangle.
With regard to conventionality, the CMGS as a whole exhibits a shift from the perceptual to the conventional. The more intricately iconic the representation, the less conventional or systematic the signs become, due to the representational demands of the signs. In contrast, more symbolic signs are highly regularized, harkening to the transfer of sinsign to legisign. This could be related to another aspect of gradation: highly iconic signs contain a higher density of conceptual information than symbolic signs. Take for instance these representations of arms:

Here, the components of each have been labeled appropriately with their corresponding written symbols. In the first, a large number of concepts are bundled together to create the larger concept of arm in an embedded fashion. The larger concept of ARM contains the visually represented parts of the deltoid, bicep, tricep, elbow, forearm, wrist, etc. Note that in the second stage, I have chosen to intermingle levels which could also be separated – those of the anatomical muscles could be placed on a lower level than the more generalized regions such as shoulder, forearm, upper arm, etc. While these sections might be mentally understood to comprise the concept of ARM generally, here, these varying parts are visually explicit. In contrast, the simplistic arm to the right lacks all of these overtly represented parts, directly exhibiting the concept of arm. Unlike the more detailed example, it is irreducible to smaller components. Thus, the more iconic the representation, the higher “conceptual density” it contains. I have

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10 Note that this image alone meshes both sides of the iconic-sound-based edge, and inherently represents the capability of transference between modalities. I acknowledge here the potential relativity of the labeling, as it comes from my own knowledge of English and anatomy, and make no claims about universality of interpretation – only that the variation of conceptual density itself should be salient no matter the linguistic affiliation so long as such images are decodable.
previously (Cohn 2003) termed this process of “becoming more conceptually simple” as “haplosis.”

As implied by McCloud (1993) at the outset of this discussion, and by the labels in the arms above, the symbolic lexeme “arm” as a sign refines this conceptual truncation even more. Here, the concept becomes explicitly concise, bundling all of those composite meanings implicitly into how we understand it while needing to represent none of them. Note that along the continuum with regard to writing, the sign transforms from a haplotic bundled iconic image into the “word” level units of meaning at the mnemonic stage. From there it refines further to a morphemic level (“word” size and smaller) both “logographically” and “phonographically,” continuing to become devoid of semantic density altogether, representing only sound units. The further along the continuum one gets, the less ability an individual sign has to convey a whole concept, until ultimately, a concept can only be expressed through multiple composites of signs.

In this way, iconic signs exhibit a degree of specificity in contrast to the generalized conception displayed by semantically sound-based or purely visual symbols. A highly iconic image represents a specified concept. It is not the generalized notion of arm represented by a word, but this arm on this person. And, as it falls upon a continuum, the more haplotic the representation, the more generalized in conception it becomes. Peirce addresses this directly, stating that the symbolic “cannot indicate any particular thing; it denotes a kind of thing” (Buchler 1940: 114). In the context of a gradation, the shift from sinsign to legisign is also invoked, because the former only occurs as singular instance of a sign and is thereby more specified to its particular representation. Legisigns, on the other hand, exist only by convention as a “type,” calling forth generalized concepts. Again, these points reflect the break between perception and conception mentioned earlier.

Furthermore, the variation in conceptual density has implications for productive learnability. Consider the vast amounts of knowledge required to draw the more realistic arm in contrast to the haplotic one. It necessitates at least a basic understanding of anatomy and the geometric shapes underlying it, not to mention additional technical know-how that might be required such as how light reflects off surfaces in order to represent shading to give an object mass. In contrast, the haplotic arm demands only a
basic understanding of the shape of an arm or hand. If simplified even more, as in a “stick figure”, the need for supplemental knowledge becomes nil. Moreover, a single word or visual sign requires only the knowledge of its corresponding referent in order to be productively used (in the case of words, how it can be inserted syntactically is also a factor). Relative ease of learnability no doubt factors into the gradation of conventionality as well, since signs that require a large amount of supplemental information are less easily dispersed in a systematic way across a large populace. Thus, “artistic” cultures that stress realistic representation could be stymieing their ability to create conventionally widespread legisigns across a larger populace.

Conversely, the time demands for actual production become inverted from those of learnability. Simple conventional signs can be produced faster than those with high amounts of detail simply because of the time demands placed on drawing. This could factor greatly in the methods by which graphic representations are used communicatively. In most of the world, graphic representation has taken static form, in contrast to the dominant form of aural language in daily life, which emerges in real-time social interactions. Static graphic signs are preserved across time and space, allowing for production at any pace because the “visual speaker” faces no demands placed by the “visual addressee” to communicate with any immediacy. Real-time interactivity requires a far faster rate of creation. In order to accommodate real-time social usage of graphic signs, as in language, the structure of the signs must be able to be produced in a speedy fashion to uphold conversational manner (Grice 1967) – thereby implying a need for more haplotic and conventionalized representation. Actual usage of this sort can be found in the sand narratives drawn by the Arrernte community in Central Australia, which feature highly haplotic iconic legisigns used in multimodal real-time exchanges (Wilkins 1997).

The aspects of temporal economy for learnability or productivity should not be taken in any sort of evaluative sense though. Often times the charge has been leveled by “pro-phonographic” voices that logographic or pictographic systems are deficient because they take more time productively than sound-based systems, and require a larger set of signs to learn in order to achieve literacy. This often entails a sort of culturally contextual bias, such as the speed at which one can type at a keyboard alphabetically,
without even imagining that a system such as Chinese characters could be converted to an equally speedy keyboard system using a different set of fundamental primitives other than an alphabetic one (which it has). Not only do these claims exert a sort of cultural superiority bias, but the argument itself is predicated upon the supposition that economy is the primary feature of writing, of which it is actually only one of many (Coulmas 1989). Rather, the intent herein is primarily concerned with explicating the relationship of iconic signs and conventionality, with emphasis on the constraints potentially placed upon the system by the sheer nature of their representational types and cultural usage.

The total gradations reflected along the lateral vector of the CMGS can be summarized:

![Diagram]

<table>
<thead>
<tr>
<th>Iconic Perception</th>
<th>Symbolic Conception</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iconic Perception (variable)</td>
<td>Symbolic Convention (fixed)</td>
</tr>
<tr>
<td>Larger density of concepts</td>
<td>Smaller density of concepts</td>
</tr>
<tr>
<td>Specific</td>
<td>General (prototypical)</td>
</tr>
<tr>
<td>High speed of acquisition</td>
<td>Low speed of acquisition</td>
</tr>
<tr>
<td>Low speed (of production)</td>
<td>High speed (of production)</td>
</tr>
</tbody>
</table>

Furthermore, given this gradation of sign forms, an important difference between writing and visual signs should be made akin to the difference between writing and speech. Namely, speech is a natural occurrence that is acquired through processes that are not forced, while writing is not (Chafe 1994) – it must be taught through rote reinforcement. Similarly, the capacity for iconic graphic representation also appears to be natural since children create graphic representations with little or no urging, with babies beginning their “graphic babbling” under a year old, then proceeding through various levels of development of visual production skills (Kindler and Darras 1997). Writing, on
the other hand, is only the transference of the aural modality into the visual modality, and thus does not have this sort of natural emergence. While this statement might seem obvious, it gains added significance in light of perceiving the visual modality as an essential domain for human’s potential for conceptual expression.

4.2 Social Understandings and Interpretations

The triangle also offers light on how visual signage is and can be interpreted. As social objects, writing and graphic signs face cultural considerations, and the CMGS can shed light on many of the presuppositions underlying their understanding and treatment.

As discussed at the outset, the orienting question of “is this representation writing?” places certain inherent constraints on the analysis at large. While previous designations revolved around their capacity to be a method of transcription – as in “Proto-Writing” or “partial writing” – this view allows different visual signs to be categorized in positions along a continuum for both their visual and sound-based functionality, with a balanced look between the two. Such a view neither exalts the status of “pictographic” writing (as in Sampson 1985) nor dismisses it (as in DeFrancis 1989). Indeed, since most writing systems have and do incorporate signs along various parts of the triangle, such a scale is useful for breaking the rigid categories imposed by taxonomic distinctions into a view based more on cognitive and representative gradation. Thus, the question is not “is this representation writing?” but becomes rather “how does the mind conceptualize this graphic representation?” which can be further tested empirically by psychological testing.

Also, such a continuum should not reflect any progression of the “evolved-ness” of writing systems. The disdain toward mnemonic and pictographic systems of representation reflects a “transcripto-centric” point of view that stresses the primacy of spoken language over other forms of communication – even when they might be linguistic, for example DeFrancis’s (1989) deriding of sign language. Rather than viewing pictographs as “dead ends” in the evolution toward full-blown writing, they can be viewed as steps along a cognitive scale between iconic and sound-based representation, serving different functional purposes within their own cultural contexts.
Perceiving them as “lesser” forms is merely a prescriptive assumption that literacy is somehow more “evolved” than other forms of expression\(^{11}\) – which thereby ranks cultures and writing systems along some sort of social Darwinist scale.\(^{12}\) This might be related to the dogma that “language is symbolic,” which does not take into account the full range of the semiotic properties of language (Clark 1997) – again, perhaps due to Saussure’s (1972 [1916]) emphasis on arbitrary signification.

Indeed, a phonographic bias has proliferated in claiming that the alphabet is the ultimate evolutionary achievement with regards to the development of writing (e.g. Gelb 1963, Goody and Watt 1963, DeFrancis 1989), while a backlash has promoted a system with no sound value whatsoever (as in Sampson 1985). These phonographically biased claims are inaccurate on numerous grounds, including historical origination and the semantic-phonologic variation found in systems (Coulmas 1989, Boone 1994, etc), and more importantly they serve to uphold a fallacy of autonomous symbolicity that denies multimodality (Clark 1997) which is valid in the graphic form as much as the spoken and gestural. Without the presumption that spoken language is the \textit{de facto} and autonomous source of semiosis, the defining of “writing” (and identification of archeological finds as such) would be far less important, and therefore conceptual expression from other modalities both concurrent and independent of speech would be acknowledged for occupying just as important a role in the creation of meaning. Indeed, if the pinnacle of “writing” is to acutely record speech, then most all orthographies in the world are deficient, and the International Phonetic Alphabet is the only truly effective writing system.

Exalting sound-based systems of visual signs, such as the alphabet, implicitly derides purely graphic signs that have no speech connection by speculating on the “progress from [the] use of pictures to the use of real writing” (Bloomfield 1933: 283).

\(^{11}\) Not to be misunderstood, literacy does lend toward the development of various types of cognitive abilities unavailable to non-literates (Goody and Watt 1963), and illiteracy is still a detriment in our modern culture. However, this is contextual to the temporal and cultural situation in which we live. Terms such as “illiterate” and preliterate” imply a deficiency with regard to some sort of evolutionary expectation set forth only by literature cultures (Boone 1994). To make claims of the “value” of literacy involves weighing qualities such as the ability of organization of argumentation garnered from literacy versus more robust memory skills found in non-literates. Such a task requires addressing qualitative evaluations that are not rooted in the context of temporal and cultural subjectivity, and I am dubious an endeavor of this sort can be done.

\(^{12}\) Which, in and of itself, is a misunderstanding of the theory of evolution (Deacon 1996).
While some orthographies might have grown generally along the path traced by the lower line of the triangle (from iconic to sound-based), evidence has mounted to illustrate that precursors to some writing did not lie in iconic signs at all, but grew from the use of purely symbolic tokens used for monetary accounting (Schmandt-Besserat 1978, 1981). This would imply that the continuum described in the CMGS is not the “pushing forward” of iconic into visual symbolism, but that visual symbolic thought was already capable and that the growth exhibited by writing systems simply transferred into the visual modality in a variety of different ways. If the theories of symbolic tokens as precursors for writing are true, then a very general developmental picture for “writing” starts at various locations along the upper edge of the triangle, jumping to the far sound-based point with a rebus, and then potentially converging inward:

Furthermore, written language did not only emerge in one singular location on earth, but in at least three separate locations (Coulmas 1989). Indeed, as Walter Mignolo (1989:62) put it, “the history of writing is not an evolutionary process driving toward the alphabet, but rather a series of coevolutionary processes in which different writing systems followed their own transformations.” These transformations most often occurred when one writing system came into contact with a spoken language that it didn’t quite fit, thus adapting as necessary to the host language it depicted (Coulmas 1989). This is perhaps closer to the understandings of actual processes of biological evolution, whereby an organism adapts in different ways out of response to its environment, as opposed to the largely ideological beliefs that evolution is a progressive force driving toward the pinnacle of homo sapiens that was given up long ago in biological science (Bowler 2003).
The gradation offered by the triangle also implies that writing comes from a transference of one modality to another, as opposed to a full blown invention unrelated to cognitive apparatuses for graphic creation that already existed. In other words, the human mind was already predisposed with the potential for making such an association because of its capacity to create visual signs. Such a correlation has then been carried out by various cultures in different ways – making writing neither an “invention” nor a “progression” but merely an adaptation. Inherent to the perception of writing as an invention is the connotation that it can be improved upon – implicitly allowing such progressive value rankings to occur, again leading toward a upholding of one system (i.e. phonographic) over the others. No doubt, this perspective has also contributed to the belief that international and universal visual symbolic orthographies could be created, despite the lack of any natural evidence that such an endeavor could ever succeed.

Just as a cultural bias exists for “phonographic” systems, similar sentiments exist with regard to the iconic side of the continuum. While more “realistic” iconic drawings have status as “high art” unquestionably, more haplotic representations such as those in comic books and cartoons have been treated as somehow less culturally “achieved.” What is interesting is that both of these cultural prejudices fall in favor of the utmost extreme ends of the continuum between the upper edge and the sound-based point, while deriding those types that lie closer to the center.

Perhaps such biases with regards to this gradation of visual representation reflect and/or aid in explaining how cultures categorize graphic signs with their words. Different languages seem to carve up the triangle in different ways, and many have used or do use the same word for what in English is separated as “drawing” and “writing,” which can be represented once again by a topographical space in the CMGS:
English isolates sound mapping versus non-sound mapping graphic representations into different lexemes—“writing” and “drawing” respectively. Note that the area between these spaces contains signs of the types found in the Egyptian and Chinese systems mapped previously—precisely those sorts of signs that researchers struggle the most with how to best categorize. Often the graphic systems in these languages seem to lie closer to the center of the triangle. For example, in modern spoken Japanese the verb kaku serves to mean both write and draw and thus covers the entire scope of the triangle. However, different kanji are used to differentiate the two senses.13

Bearing in mind the analysis of the Japanese graphic system done earlier, which occupied much of the lower half of the triangle, this break is interesting, as the spoken form unites the different conceptualized areas while the graphic domain separates them. Indeed, the boundaries of these senses of the spoken sign themselves might not be as

13 Many Japanese words take on this dual character for related senses, illustrating again the heavy stress on the graphic form for semantic qualities in written Japanese. For instance, hayai can mean both early and fast but is only differentiated in kanji.
defined as in this depiction either. Historically, the most dominant and popularized Japanese graphic representations in “art” have remained fairly haplotic and integrated with writing, from 11th century scrolls to 19th century woodblock prints, even into contemporary manga (“comics”) (Schodt 1983).

Another relativistic mapping occurs in Pre-Columbian American cultures, such as the Nahuatl speaking Aztec, whose word tlacuiloltli was used for both “writing” and “painting” (Molina 1970: 120).

This categorization seems to reflect the graphic systems of Pre-Columbian South American societies, which smoothly integrated sound-based hieroglyphics with highly haplotic representations and abstract signs to varying degrees (Boone 1994).

No doubt there are many more instances of variation with regards to the conceptions of graphic sign systems, and a typological study looking into the conceptualizations of these categories in relation to their treatment of them could no doubt yield interesting results. Indeed, in the case of English, the two concepts of “drawing” and “writing” have been separated, along with a cultural prejudice towards the outer boundaries of the CMGS.14 In this light, the previous attempts to define and categorize graphic systems implicitly place the English categorization of “writing” as the baseline for a supposed universal understanding. This is a common occurrence with regard to linguistic relativism, most exemplified by the “Eskimo snow” example from Whorf (1956). Lucy (1992: 148) argues that most critiques dismiss that “Eskimos have

14 Speculatively, the Western cultural rift between Art and Language (and Art and Literature) has influenced our own separation of the concepts of “drawing” and “writing” (though if the reverse is true, it would be a fascinating discovery!).
three words for snow” by faulty framing, in that such a statement creates the baseline concept as the English word “snow,” claiming then that Eskimo has three of “it.” Rather, it would be more accurate to say (as was done by Whorf through drawings and text) that there is stuff out there in the world, and English has one word for it (snow), while Eskimo has three. The same thing occurs with regards to “writing,” in that the English concept has been taken as the baseline for analyzing all visual sign systems.

Rather than acknowledge a diverse continuum of representations, and show that English cuts it up in a particular place to identify “writing”, the English notion has been presupposed as non-relative and universal. Thus, the analysis of systems as “writing” hinges upon the categorized features of that English concept, instead of acknowledging the diversity of graphic systems and relativism of the understanding of them. As a result, anything not adhering to the confines of “writing” becomes exorcised from consideration as a like-phenomenon (as in “Proto-writing”) or results in legitimization by overemphasizing the similarity of other systems to that definition (as in DeFrancis 1989).

This is precisely the problem that researchers working with Nahuatl encountered, forcing them to question the domain of “writing” as a whole. Because these systems integrate iconic and abstract with sound-based signs, it leads Elizabeth Boone (1994: 3) to state in her introduction to a collection of writings about Pre-Columbian graphic systems,

“Because there is a tendency to think of writing as visible speech and an evolutionary goal, the word “writing” when it pertains to Pre-Columbian America begs to have quotation marks around it. In indigenous America, visible speech was not often the goal. The word “art,” too, carries with it modern Western notions of art as something visual to be appreciated and enjoyed but something separate from communication. Thus, the word combination “Art and Writing” seems to polarize the two and set up an either/or situation, where a visual system is either “art” at one end or it is “writing” at the other. … [For Pre-Columbian Americans these signs] compose a graphic system that keeps and conveys knowledge, … that presents ideas. And it is this view of Amerindian… systems that should replace the old, limited notions that have previously been advanced.”
Resolving these categorization issues are difficult, because they reflect the practices engaged by cultures with regards to graphic creation. The surface solution for researchers is to acknowledge the relativity inherent in the conceptualizations of graphic signs and be aware of them. Beyond that, recalibrating the way that people talk about graphic signs in daily speech is an unrealistic task to impose on a language group without it reflecting the practices of the culture as a whole. Rather, conceptual categorization must progress along with cultural usage. If the English speaking culture – which currently separates “drawing” from “writing” – were to begin using graphic production more like language, then terminology would no doubt arise to reflect those uses.

In some circles, this may have already begun. Among many authors of comic books, their process is often expressed as “writing in pictures.” The hugely influential comic author Will Eisner has described receptive end of this process, stating, “Comics can be called ‘reading’ in a wider sense than the term is commonly applied” (Eisner 1985: 7), and in defending their cultural value that, “In every sense, this misnamed form of reading is entitled to be regarded as literature because the images are employed as a language” (Eisner 1996: 5). In this context, “writing” and “reading” already extend beyond just correlations of graphic signs with speech, and reflect the actual practices and conceptualizations of a cultural group.

5. CONCLUSION

When bearing in mind the semantic qualities of the graphic form, the diverse range of “writing” and visual signs is revealed to be graded and transcendent of the limited categories placed on them. While this investigation has shown that individual systems linking to sound lie on a continuum and occupy varying areas of cognitive space, actual usage is and can be even more varied. Because all realms of the triangle exist in the graphic domain, very little restricts the possibility for integration between the various areas except for social ritual. For example, symbolic hearts can be inserted into sentences such as “I © Chicago” or into drawings, as in “cartoony” hearts replacing a person’s eyes to reflect the adoration they have for the object in their vision (Pérez and Coughler 2004):
Writing can appear within visual signs in a variety of contexts. For instance, it might appear integrated into the representation itself, or be interfaced through an abstract visual sign, such as a speech balloon:

Writing can also be substituted for graphic elements in the same way that iconic signs can be inserted into written sentences:

Indeed, the influence of visual signs on linguistic production seems to permeate grammatical constructions as well. Note this example, taken from the t-shirt of a political activist:
Unlike the heart symbol, which conventionally stands for LOVE, the skull-and-crossbones sign lacks a specific regularized semantic extension. However, in this case, it enters a formalized sentence construction, no doubt influenced by the “I _____” formula whereby the pattern “I Visual Sign NP” invokes a relationships of the visual sign to a transitive verb of emotion, linked to the direct object following it. As a result, the slight symbolic semantics garnered from the iconic representation creates an understandable meaning when inserted into the sentence pattern. That a sentence pattern like this uses graphic signs in an explicit and central role gives further support for the tight integration of photological structures to a mental grammar.

All of these examples reinforce the mutability of signs within the graphic domain – both connecting to sound and not, and each example must occupy a variety of positions within the triangle. Just as the CMGS as a whole is graded, the actual usage of graphic signs need not be considered to be restricted either. These are precisely the issues facing researchers of Pre-Columbian America described previously, because the systems they encountered occupy a broad range within the space of graphic representation. As this paper has attempted to illustrate, most systems are mixed, with no cognitive boundaries limiting those resultant combinations of graphic sign usage. The perception that various types of graphic production lie separated into discrete categories is only one of social bias, as are the ways by which they are defined in the English language at least. Overlooking the visual realm’s influence on the meaningfulness of written signs is a grave error, and equally bad is believing that purely graphic signs lack as rich a potential for signification. Moreover, as the triangle implies, different types of representations have strengths in different types of semiotic expression, be it iconic, indexical, or symbolic. Tapping into various parts of this graphic system allows for a more holistic type of conceptual expression, reflecting the necessity for mixed semiotic signs in communication (Clark 1996, 1997).
As a whole, research must acknowledge the graphic modality as an essential part of the conceptual expression of humans, both connected and disconnected with speech, and thereby explore those similarities and departures. Just as this conceptual approach has blurred the boundaries between the presumed categories of writing, such an investigation might yield further deconstruction of just what it means to be “linguistic” when considering a sign to gain a broader understanding of the mind and human communication.

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