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Human Evolution
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In regards to cognitive human evolution, the emergence of external symbols radically changed the medium of memory storage. This phase – the externalization of memory – is commonly referred to as "literacy," which would "encompass all of the new skills needed to use every kind of permanent external symbol." (Donald) This includes symbols and phrases on various highway and road signs used around the world. While the creation of road signs is fairly recent – especially considering the entire course of human evolution – their design can tell us a lot about our own cognitive evolution. Initially, signs were simple milestones that gave distance and direction. With the development of automobiles, more complex signage systems were utilized. The methods in which highway signs communicate are via shortening of words or phrases, pictorial symbols, color palette, and shape. In these ways, highway and road signs are distinguishable nationally as well as globally. However, the ability of highway signs to function so effectively has seemingly conflicting origins: do highway signs function by catering to the innate cognitive abilities within human beings, or do they operate and rely on learned behavior?

Highway signs, in terms of evolution, can be classified as tools. They compensate for our inability to predict directional changes in the urban landscape, as well as failure to make rational decisions at high speeds. There is a correlation here with the theorized "savanna mentality," which postulates a desire to be aware of one's surroundings. Since the city environment, in terms of landscape, is dissimilar to the savanna's terrain, there is compensation for our inability to view wide expanses of space. Environments like savannas attract us. Their traits include long, unimpeded views. Signs – in particular, highway signs – help to inform us of that which we

cannot naturally observe. Even so, highway signs make use of human's cognitive ability to plan ahead; to make decisions that do not have an immediate effect. They also serve as a form of external memory in that they direct people through familiar routes. They serve as reminders just as much as they serve to communicate new information. But, as Donald Merlin explicates,

> "There is a neuropsychological dimension to all of this... Once, there were virtually no external symbols... and then human were rather rapidly surrounded by the thousands of symbolic codes and conventions that mark modern society. This has amounted to a virtual invasion of the brain by culturally imposed programming [...] An adequate description of this transition... should include all of the internal programming needed to manage this massive culturally driven load on the brain."

This supports that highway signs dictate their meaning, instead of merely functioning on the innate ability of humans to interpret symbols. While there are correlations between geometric shapes and the evolution of the human mind, not all symbols and colors and patterns are universal. Each sign has its own cultural context, which must be taught.

Take, for instance, two speed limit signs. The first – Figure 5.1 (see Appendix) – is a simple text and number combination. This sign is used in the United States. The words "speed limit," are, therefore, written in English, and the accompanying number 30 does not have any rate or measurement after it. This is a case where cultural factors such as language make the literacy of the sign based in learned behavior. The second sign – Figure 5.2 – is also reliant on cultural context. This sign is from the United Kingdom, and it too serves to dictate speed limit. However, it is only comprised of red ring surrounding the number 40. Unlike an arrow, which clearly indicates direction, the number could have multiple meanings, especially to someone from another country, for instance. People, thereby, must be taught how to interpret the sign for

its shape and color combination. The fact that prospective licensed drivers are required to take a road test in where they must learn the meaning of various signs supports the fact that there is a duality in the design of highway signs: they inform and as well dictate meaning. A 1942 article from *Popular Science* magazine revealed that only 1 in every 1,000 motorists was able to identify, by shape, more than three of the seven signs highlighted in the article.

However, that article also mentions an innate ability to interpret a symbol's intent: "A long time before he is able to read what a sign says, he knows by observing the square or diamond that he is to be an on alert, just as he knows, by noticing a cross-buck, that it is time to look out for a train." (Van Duyne) As Tudor Vieru states in his article about shape perception, "people have a sense of geometry, and of shape perception, regardless of the influences that they receive early in life. This basically means that the brain is able to develop shape perception all by itself." This connects to the mimetic consciousness concept and its association with tool findings at Olduvai Gorge. The symmetry of weapons found there indicates enhanced cognitive ability and creativity, which is extended to signage design. Figure 2, for instance, has a specific shape and color attached to it, which acts a template for a warning sign. It advises drivers of slippery roads. The acute angle, the bright, off-putting color, as well as the metal's reflective quality makes this sign function most effectively as an alert. While the message on the sign is what identifies it, the design of the highway sign catches people's attention from a distance, which is a good quality to possess in a highway environment.

There is evidence, nevertheless, that perhaps the effectiveness and functions of highway signs stems from a simultaneous process: they dictate the meanings of symbolic combinations, as well as adapt to the capabilities of human cognition. The concept of assumptions plays into this

duality. The ability to make assumptions relies on previously gained information, as well as the capacity to predict intent. As Vieru postulates, "research indicates that, whenever a clear answer is not immediately obvious from the situations people are presented with, their brains fall back to making reasonable guesses." Highway signs use abbreviations that function on the knowledge that people can make "reasonable guesses;" we only need part of a word or phrase to draw a logical conclusion as to what it is referring.

For example, the George Washington Bridge sign – Figure 1 – is abbreviated as "Geo Washington Br." While "Geo," out of context, can reference a multitude of words, since it precedes "Washington," people come to the logical conclusion that it is a shortening of "George." It can even be argued that the sign would still be readable if "Geo" was omitted. However, this ability to predict intent is contingent on previous knowledge of the bridge's name. And the abbreviation of bridge as "Br" also stands as an example of the capacity of humans to make reasonable assumptions. In this instance, however, the abbreviation's functionality also stems from learned behavior, which is to say that humans are taught to connect "Br" with bridge, as they do with the abbreviations for street, avenue, road, etc.

As Vieru further explains, "when the objects test subjects saw became blurry – they had less data to rely on – their brains registered a shift in activity, from the vision center of the cortex to parts of the brain that receive sensory impulses from the eyes directly." The shorthand and reductive quality of highway signs correlates with the speed at which one is going. In order for highway signs to be readable at high speeds, they use graphic symbols and colors, often times even omitting words completely. A good instance of this is seen in Figure 4. It is a Portuguese sign comprised of a white arrow against a blue circle, standing on a black and yellow striped post. Signs such as these – that utilize only basic forms – are present throughout the world.

Our ability to adapt to reading reduced signage is universal in that respect. An American in Portugal, theoretically, would be able to interpret the sign correctly. The fact that is does not incorporate words – and thereby restricting its communicative function to a common language – makes it even more effective.

We must also take into account our brain's ability to interpret different symbols simultaneously. An example of this capability – or rather, expectation of this capability – is shown in Figure 3. This sign combines many pieces of information into one format. Based on font choice, color differentiation, word and symbol placement, a driver is expected to be able to interpret the sign's meaning. While functioning on previously obtained knowledge concerning what each symbol means, this sign also relies on our cognitive ability to decipher different symbols simultaneously as well as separate them in meaning. The driver knows, for instance, that :Exit Only" does not directly correlate with "Atlanta," but is instead a separate message. This is an ability that has important implications on the evolution of human intelligence. Even the simplest "social, tool-using and linguistic tasks" appear to require duplication and multiplication of sensory networks. (Gibson, and Ingold) The fact that we are able to interpret a combination of seemingly random symbols and words indicates our evolved cognitive capacity. We are so familiar with these symbols, such as arrows, and words that we can interpret them even while driving at high speeds. And the fact that we can understand symbols within a specific context – highway signage – is also indicative of our evolved cognitive ability as humans.

That humans make highway signs at all – or signage in general – is also links to the evolution of the human mind. It is the idea of "shared intentionality," which is the ability to participate with others in collaborative activities with shared goals and intentions. The idea under this theory is that the "basic motives of human communication are requesting, informing, and

sharing." (Dubreuil) With this theory in mind, it is natural to strive to make improvements of communication devices such as highway signs. My proposition involves improvement on the clarity of intent. I would make the arrows more specific; their basic nature and subtle differences can make it difficult to interpret their meaning in a given situation. And I would make the signs more noticeable from afar, so as to not become aware of them only when in close proximity. Drivers, especially on highways, need to able to make decisions in advance.

Appendix:

FIGURE 1


FIGURE 2

FIGURE 3


FIGURE 4

FIGURE 5.1

FIGURE 5.2

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