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Letters in All Writing Systems Traced Back to Nature

By Robert Roy Britt
 LiveScience Managing Editor
 posted: 25 April 2006
 07:49 am ET

The shapes of letters in all languages are derived from common forms in nature, according to a new hypothesis.

The idea, in some ways seemingly obvious and innately human, arose however from a study of how robots see the world.

Robots employ object recognition technology to navigate a room by recognizing contours. A corner is seen as a "Y," for example, and a wall is recognized by the L-shape it makes where it meets the floor.

"It struck me that these junctions are typically named with letters, such as 'L,' 'T,' 'Y,' 'K,' and 'X,' and that it may not be a coincidence that the shapes of these letters look like the things they really are in nature," said Mark Changizi, a theoretical neurobiologist at the California Institute of Technology.

Changizi and his colleagues think letters and symbols in Chinese, Latin, Persian, and all 97 of the other writing systems that have been used throughout the ages have shapes that humans are good at seeing.

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Even graphic art that is not necessarily alphabet-based conforms to the idea.

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"Company logos, for example, are meant to be recognized, and we found that logos have a high correlation," Changizi said. "Shorthand systems, which are meant to give a note-taker speed at the expense of a commonly recognizable system of symbols, do not."

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Researcher Suggests All Writing Symbols Come From Nature

Tuesday, April 25, 2006
By Robert Roy Britt



The shapes of letters and symbols in all languages are derived from common forms in nature, according to a new hypothesis.

The idea, in some ways seemingly obvious and innately human, arose however from a study of how robots see the world.

Robots employ object-recognition technology to navigate a room by recognizing contours. A corner is seen as a "Y," for example, and a wall is recognized by the L-shape it makes where it meets the floor.

"It struck me that these junctions are typically named with letters, such as 'L,' 'T,' 'Y,' 'K,' and 'X,' and that it may not be a coincidence that the shapes of these letters look like the things they really are in nature," said **Mark Changizi**, a theoretical neurobiologist at the **California Institute of Technology**.

Changizi and his colleagues think letters and symbols in Chinese, Latin, Persian and all other writing systems that have been used throughout the ages have shapes that humans are good at seeing.

"Evolution has shaped our visual system to be good at seeing the structures we commonly encounter in nature, and culture has apparently selected our writing systems and visual signs to have these same shapes," Changizi said.

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The idea is put forth in **The American Naturalist** magazine.

Changizi notes that a basic shape such as "L" can be easily bent to form a "V." He found 36 shapes that require just two or three contours, and he then correlated these shapes to common scenes in nature and in ancient architecture.

"So the figures we use in symbolic systems and writing systems seem to be selected because they are easy to see rather than easy to write," he concludes. "They're for the eye."

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"Company logos, for example, are meant to be recognized, and we found that logos have a high correlation," Changizi said. "Shorthand systems, which are meant to give a note-taker speed at the expense of a commonly recognizable system of symbols, do not."

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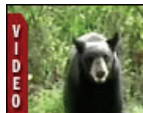
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Writing traced to nature, ancient shapes

Neurobiologist sees link between letter forms and common scenes

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This circa-1908 picture shows four canvas-covered teepees in South Dakota. Neurobiologist Mark Changizi found that the distribution of letter forms correlated with the distribution of common shapes in nature and ancient architecture (such as the inverted "V" of a teepee).

By Robert Roy Britt

LiveScience managing editor



Updated: 2:14 p.m. ET April 25, 2006

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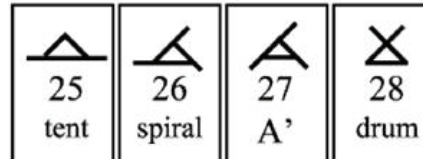
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The "tent" shape and other teepee-style forms are among the 36 basic shapes cataloged by Mark Changizi and his colleagues.

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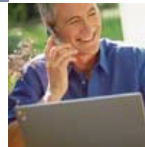
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Güncelleme: 09:00 TSİ 26 Nisan 2006 Çarşamba

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reklam



Robotlar, köşeleri üç çizginin kesişimi temelinde 'Y', duvarları ise 'L' olarak algılıyor.

Araştırmayı yürüten California Institute of Technology nönoloğu Mark Changizi araştırmayı şöyle açıklıyor: "Robotların algısını incelerken, onların görüş açılarının bizim kullandığımız harflere benzediğini farkettim, örneğin, L, T, Y, K ve X gibi harflerin robotların görüş algısında yeri var. Bu algılar aslında doğanın birer izdüşümü olduğuna göre, insanlara da uygulanabilir."

97 YAZI SİSTEMİ İNCELENDİ

Changizi, Çince, Farsça, Latin ve 97 diğer yazı sistemindeki harf ve sembollerin insanların çevrelerinde algıladıkları şekillerin birer yansıması olduğunu söylüyor ve ekliyor; "Tabii insanlar robotlardan daha güçlü görüş algısına sahipler."

EVİRİM SÜRECİNDE ALGI YETİSİ GELİŞTİ

Changizi, evrim sürecinin insanların doğadaki şekilleri görüş algılarını geliştirdiğini ve bir coğrafyadaki kültürün yüzey şekillerinin nasıl algılanacağını etkilediğini belirtiyor. Buna göre, bireysel algı kültürel değerlerle birleşince insan toplulukları arasında ortak semboller ortaya çıkıyor. Ortak semboller, ortak fiziki coğrafya ile bunu algılayan kişilerin anladığı bir şekiller bütünü olarak geliyor. Yeni kuşakların kattıkları da buna ekleniyor.

L VE V TEMEL BİÇİMLER

'L' şeklinin 'V' şekline dönüşebileceğini dile getiren Changizi, temel üç şekli baz alarak 36 türev şeklin geliştirilebileceğini vurguluyor. Bu şekillerin tümü de doğadaki fiziksel şekillere denk düşüyor. Bu teze göre, yazı için kullanılan semboller, insan gözünün kolay tanınması için hep algıladığı doğa şekillerinin birer izdüşümü.

Kaynak: Araştırma *The American Naturalist* deraisinde vavımlanmıştır.

