

Introduction to Cognitive Science - Term Paper 1

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1. When asked to name the object seen in the image (below), the answers range from bird, boat, just irregular shapes, to hanuman. But if someone sees 'snow-covered farm buildings', then it is perception. Now understand a) what can be the possible explanation for someone to 'see' snow-covered farm building? and b) given most Indians have not seen such a scene how will they form it given the clue?

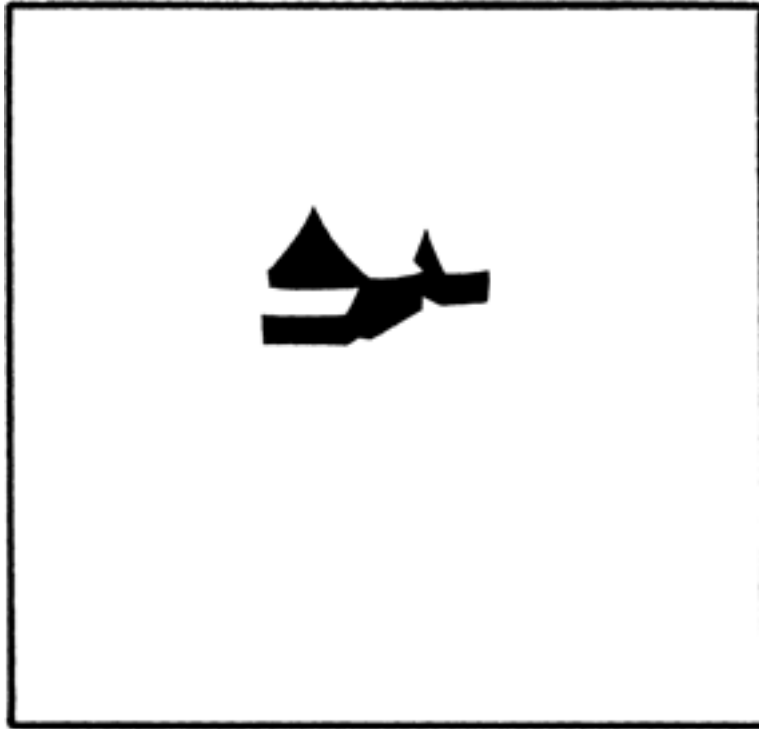


Figure 1: Perception experiment

- Top-down perception. Gestalt principles. (Todorovic 2008)
- Experience of having seen snow covered farm buildings, so recognises the pattern. Experience-dependent plasticity. (Blakemore and Cooper 1970)
- A situation would be whiteout, white everywhere except for walls because snow is not sticking on vertical surfaces.
- Indians:
 - Not matching it instantly, so trying to process bottom-up. Does not fit any mental model.
 - Everyone was ignoring the whitespace
 - Lots of answers were dinosaur - maybe inspired by the chrome game? It also has blocky dinosaur, made entirely from simple dark shapes. Whitespace does not play a part in that.
 - Some fun answers:
 - * view of distant mountain + sailboat from a jetty (white space considered)
 - * Broken sphinx
 - * Anime Hair
 - * Mountain and valley with river (again, completely ignoring whitespace)
 - * 2004 graphics superman
 - * When I mentioned “wouldn’t see this in most of India” - Robot Dog
 - The person who lives in Boston for 3 years instantly got it.
 - Only one person got it without a “climate” hint
- How it’s being formed: bottom up. Trying to identify the big triangle as a wing and that below as a tail (dragon). Or making the upwards-triangles mountains and the other black section river. RBC. (Biederman 1987)
- Even after getting it one person kept seeing the roof in the front as a garbage dump - like in Tom and Jerry, or the Maguire Spider-man movies - as that was the experience and not a farmhouse.

2. **“Mirror Neuron Theory is a myth.” Explain the mirror neuron theory based on Giacomo Rizzolatti’s work. What are the criticisms against it and what is your opinion on this debate?**

- Explanation
- Criticisms
- Opinion

Biederman, Irving. 1987. “Recognition-by-Components: A Theory of Human Image Understanding.” *Psychological Review* 94 (2): 115–47. <https://doi.org/10.1037/0033-295X.94.2.115>.

Blakemore, Colin, and Grahame F. Cooper. 1970. “Development of the Brain Depends on the Visual Environment.” *Nature* 228 (5270): 477–78. <https://doi.org/10.1038/228477a0>.

Todorovic, Dejan. 2008. "Gestalt Principles." *Scholarpedia* 3 (12): 5345. <https://doi.org/10.4249/scholarpedia.5345>.