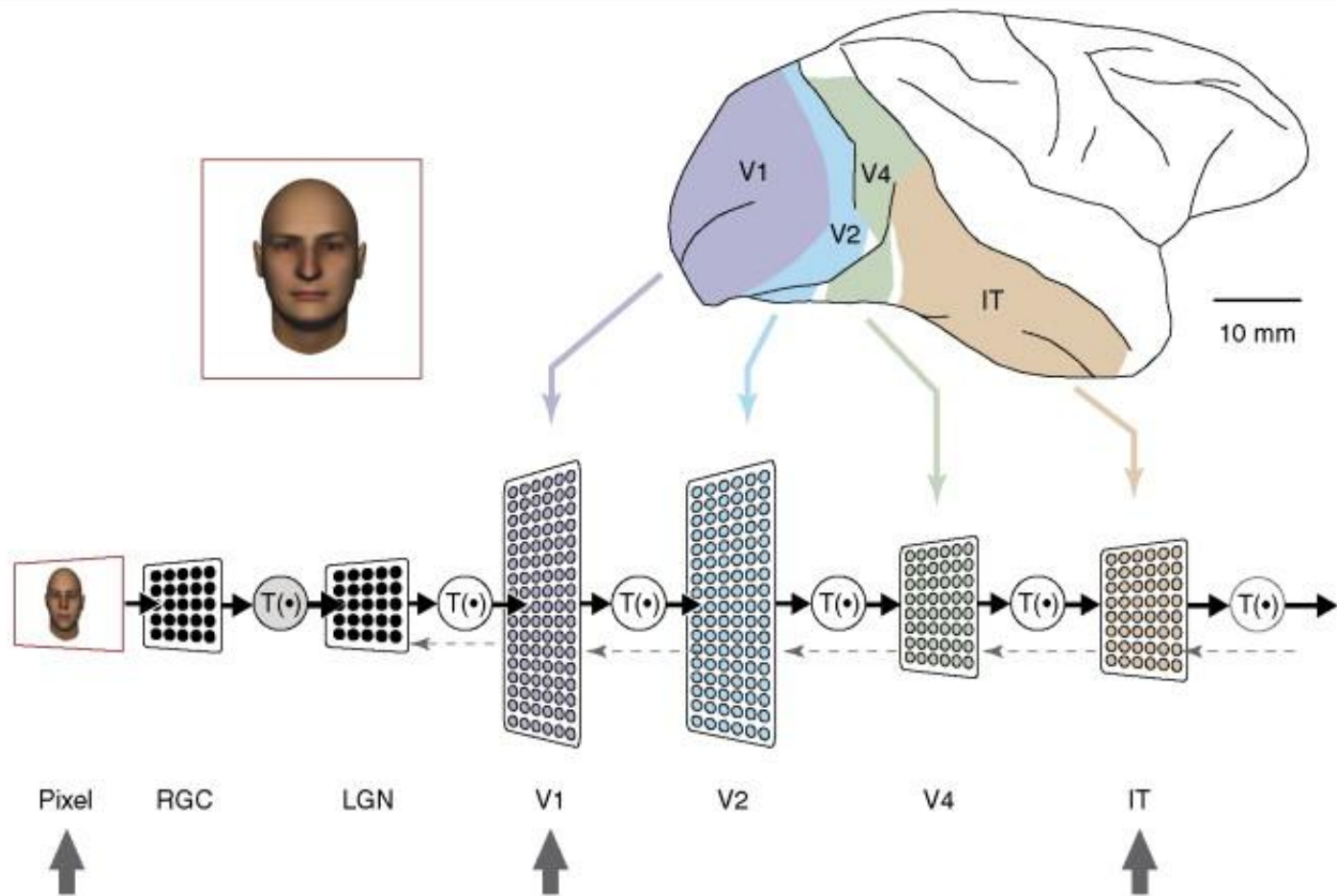




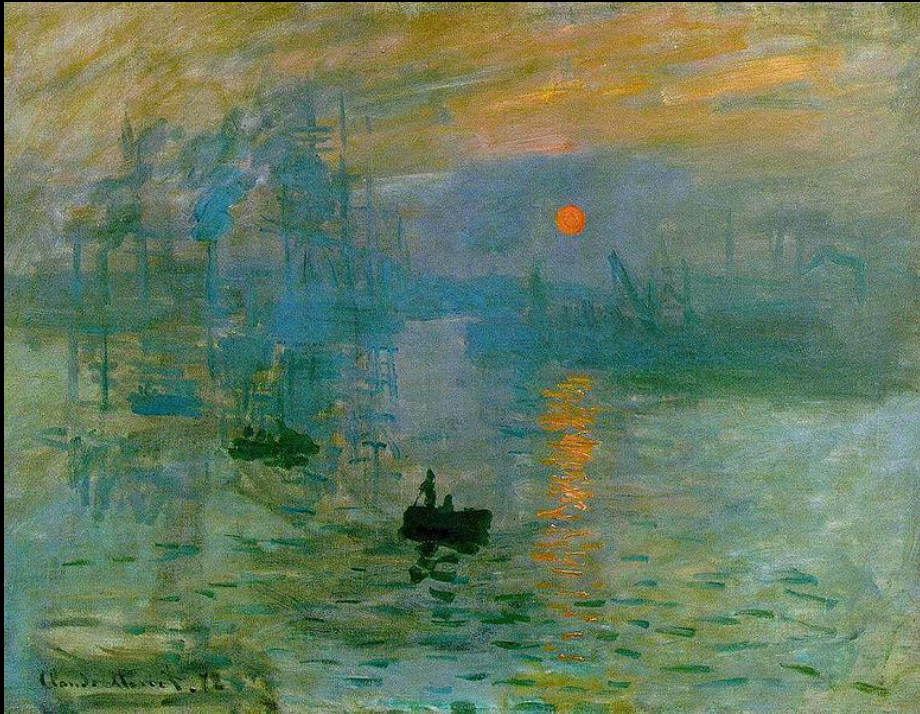
some examples from vision research

our visual system

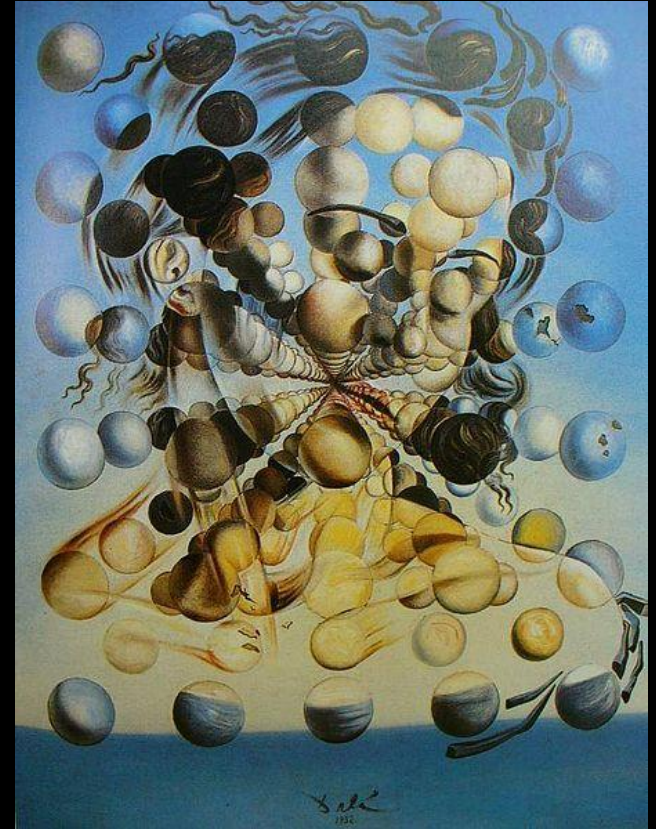


TRENDS in Cognitive Sciences

impressionism and the gist

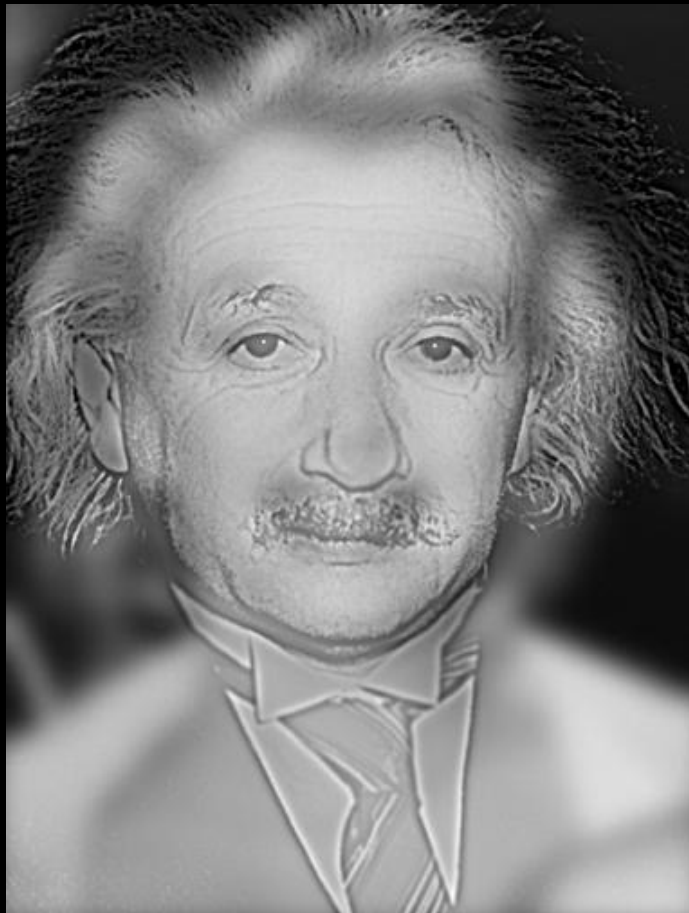


Claude Monet. *Impression, Sunrise* (1872)



Salvador Dalí. *Galatea of the Spheres* (1952)

impressionism and the gist



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.5 c/d.



1 c/d.



2 c/d.



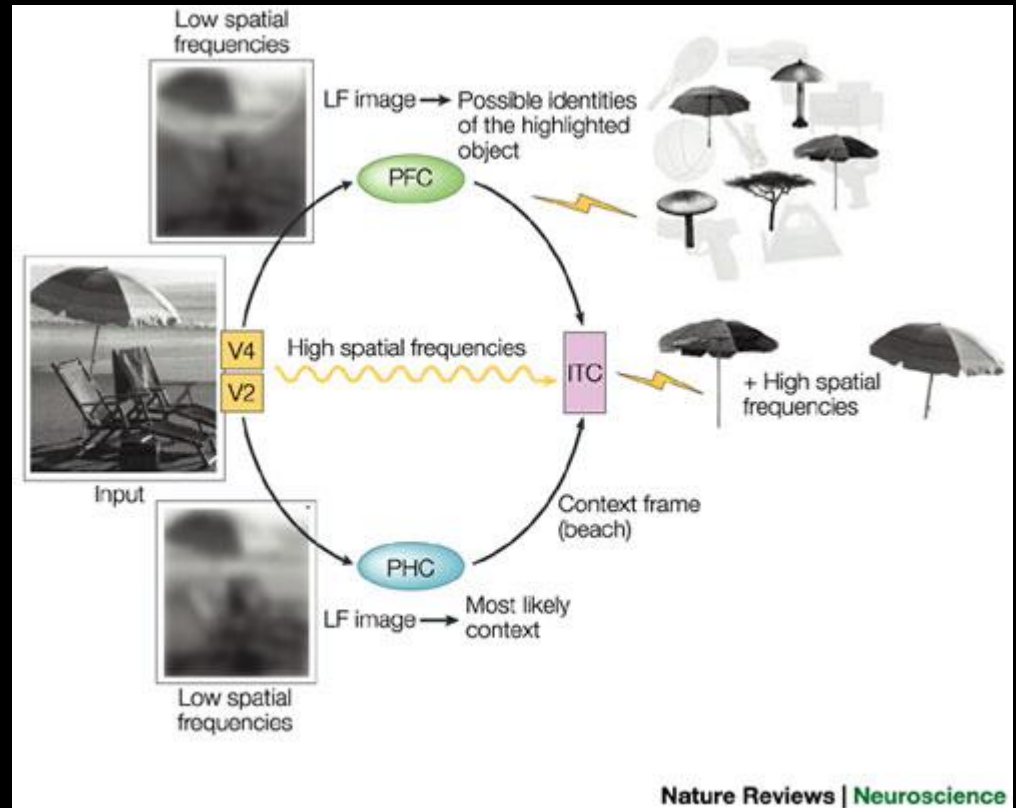
4 c/d.

Oliva & Schyns, *Cognitive Psychology* (2000)

impressionism and the gist



Torralba & Oliva, *Network: Computation in Neural Systems* (2003)



Moshe Bar, *Nature Reviews Neuroscience* (2004)

cubism and recognition by components

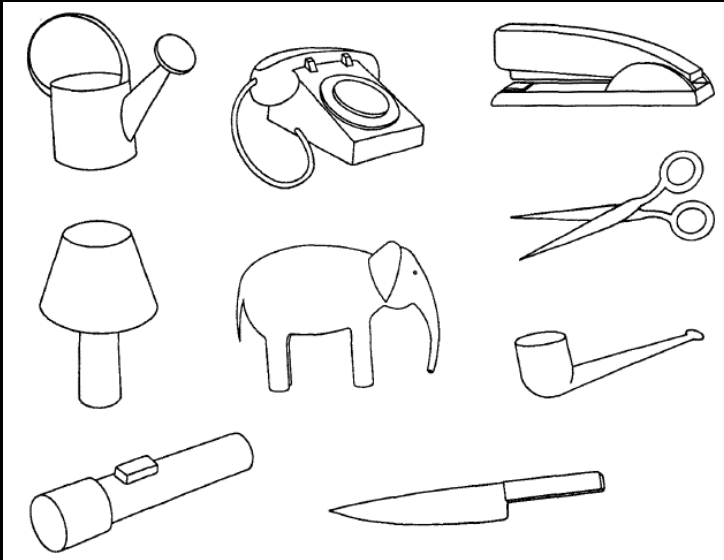


Pablo Picasso, *Les Femmes d'Alger* (1911-12)



Georges Braque, *Violin and Candlestick* (1910)

cubism and recognition by components



Biederman, *Psychological Review* (1987)

The set of geons is generated by variations in the production function for generalized cylinders that produce viewpoint-invariant (= nonaccidental) shape differences

1. Cross Section: Straight vs. Curved



2. Axis: Straight vs. Curved

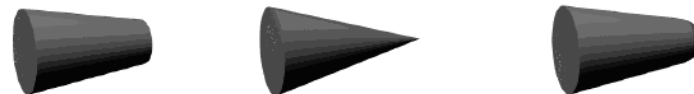


3. Size of Cross Section:

Constant (parallel sides) vs. Expand vs. Expand & Contract vs. Contract & Expand



4. Termination of Geon when Nonparallel: Truncated vs. Pointed vs. Rounded



[Wikimedia Commons](#)

futurism and unsupervised temporal learning

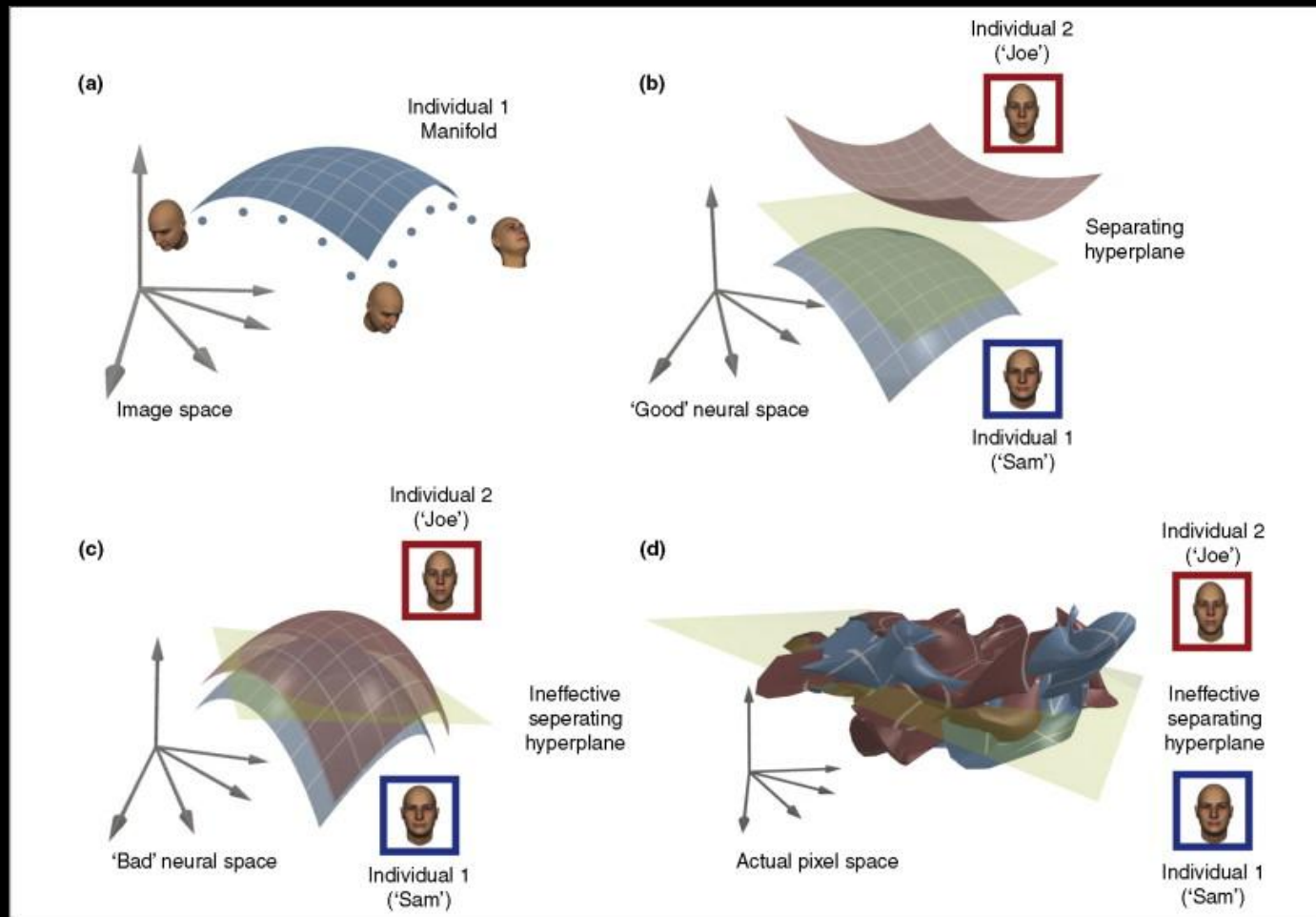


Marcel Duchamp, *Nude Descending a Staircase, No. 2* (1912)

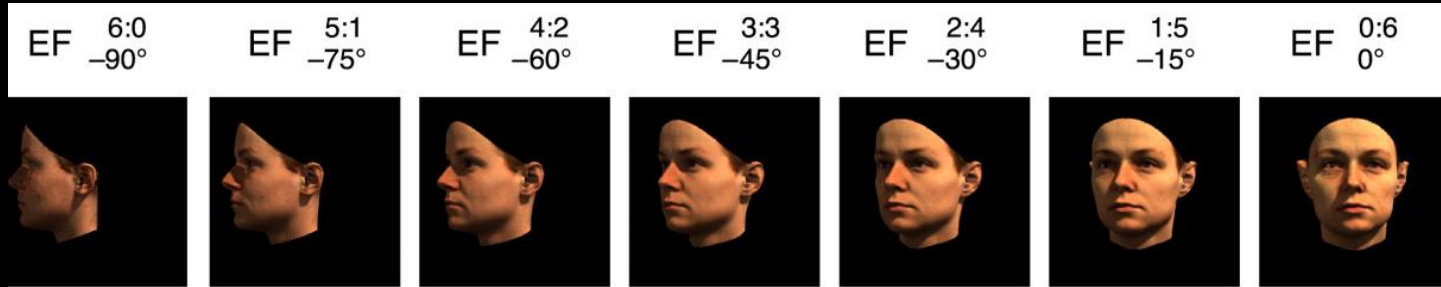


Umberto Boccioni, *Unique Forms of Continuity in Space* (1913)

futurism and unsupervised temporal learning

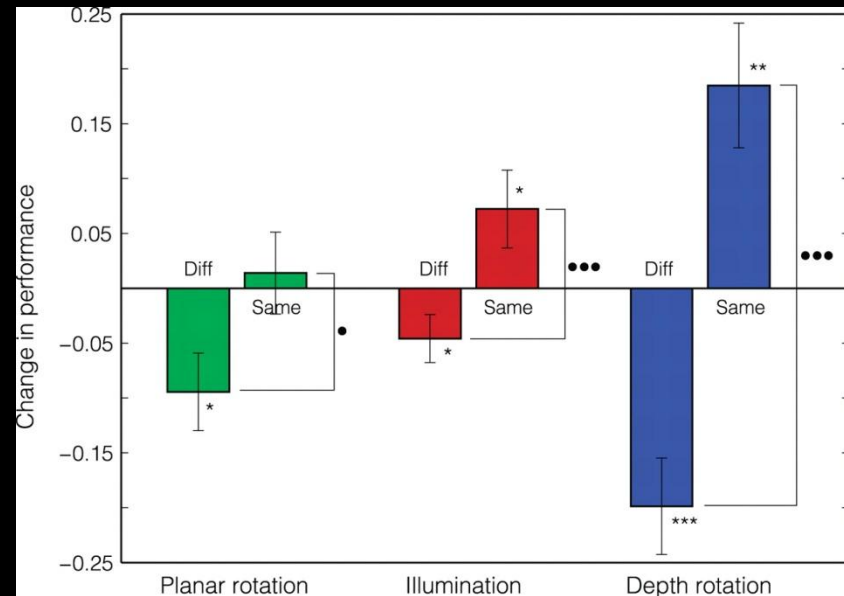


futurism and unsupervised temporal learning



1. rotated faces shown;
sometimes the face is the same,
but sometimes it changes to
another face while rotating

2. people start confusing faces
that were changing during
rotation (blue Diff), i.e., two
different faces start looking alike

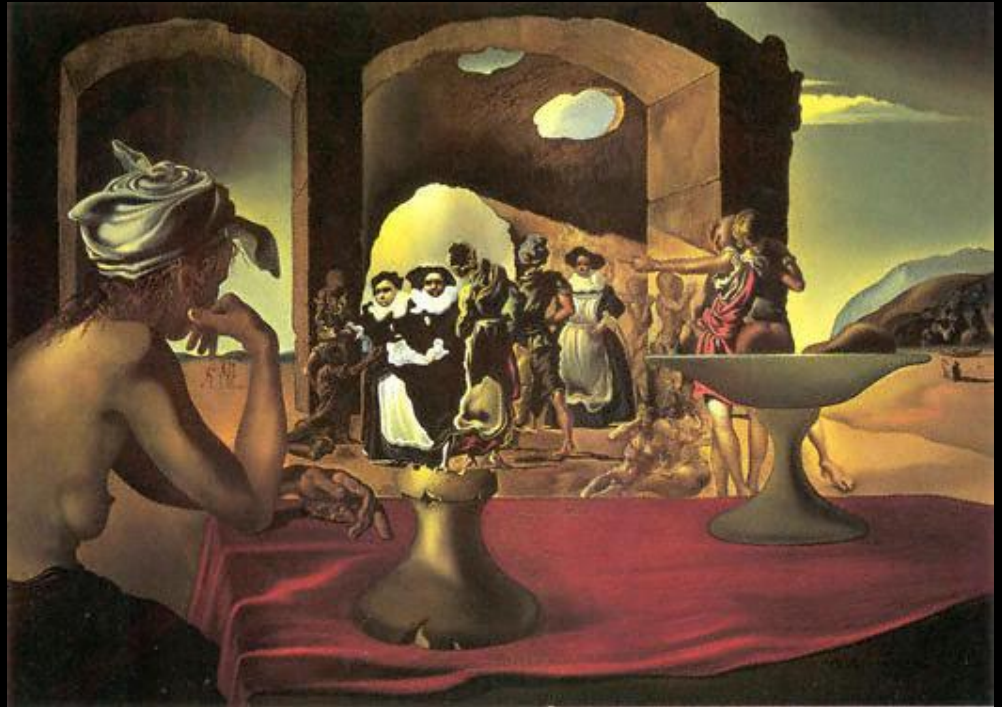


Wallis et al., Journal of Vision (2009)

surrealism and faces



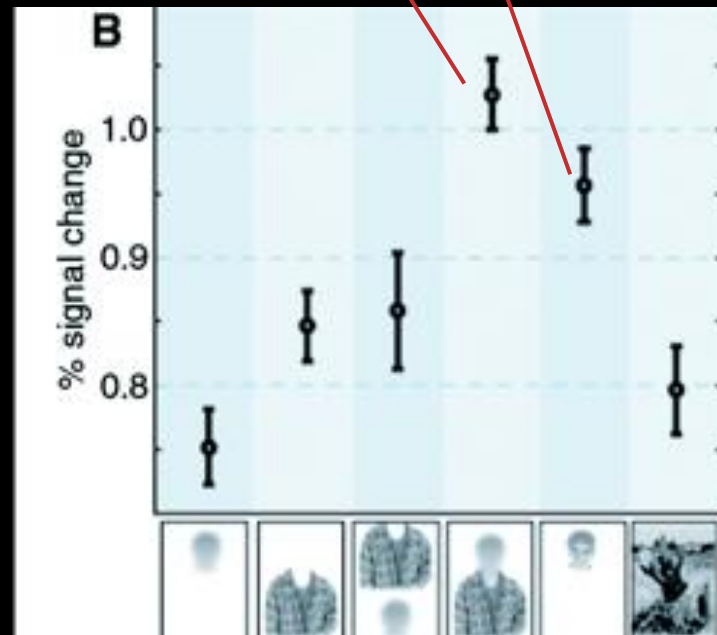
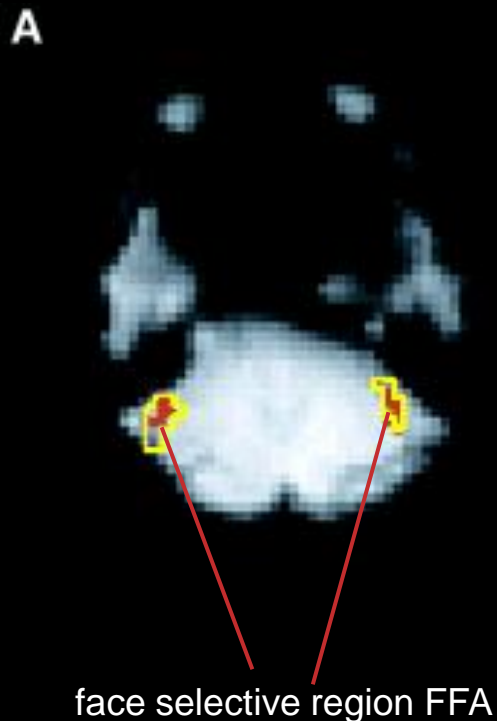
René Magritte, *The Son of Man*, 1964



Salvador Dalí, *Slave Market with the Disappearing Bust of Voltaire* (1940)

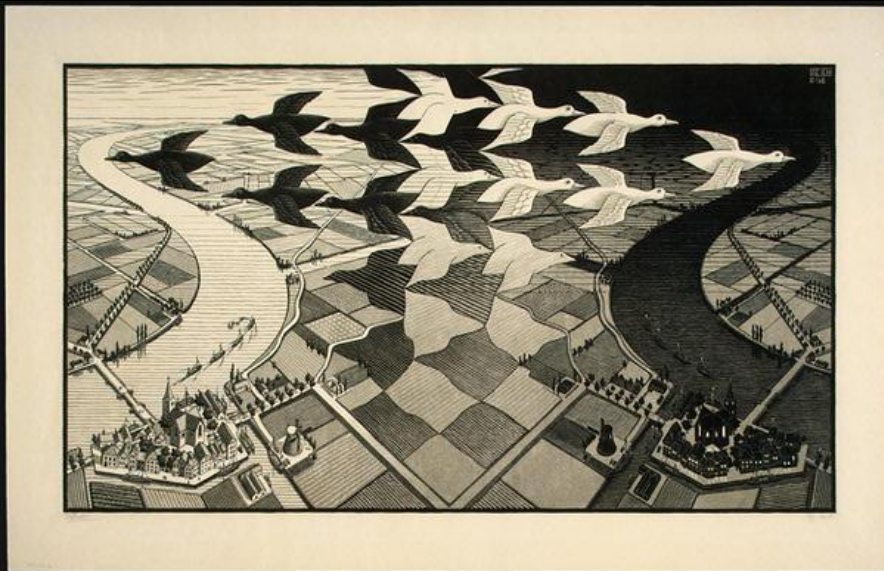
surrealism and faces

contextual information suffices to activate FFA
(works even better than the actual face!)



Cox, Meyers & Sinha, *Science* (2004)

escher, magritte and figure-ground



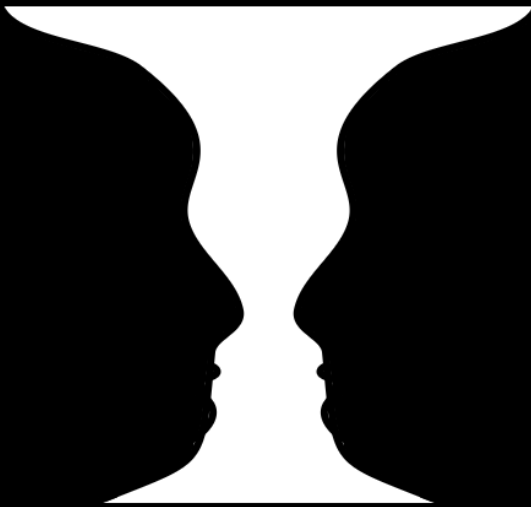
M.C. Escher, *Day and Night*, 1938



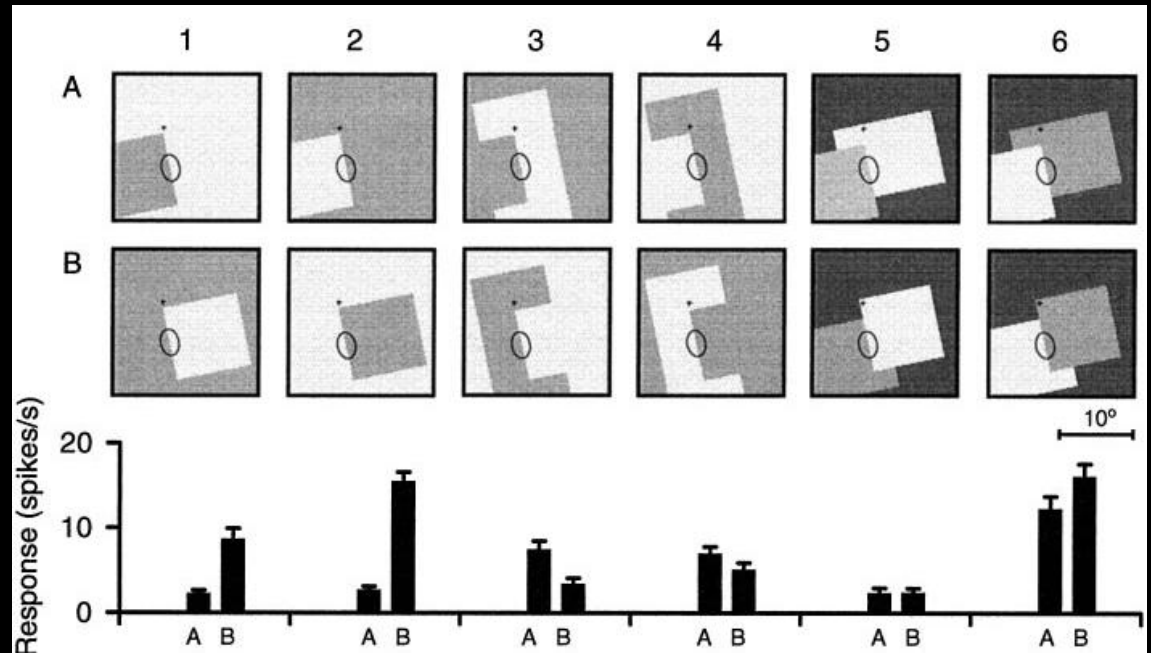
René Magritte, *The Blank Check* (1965)

escher, magritte and figure-ground

a single cell response



[Wikimedia Commons](#)

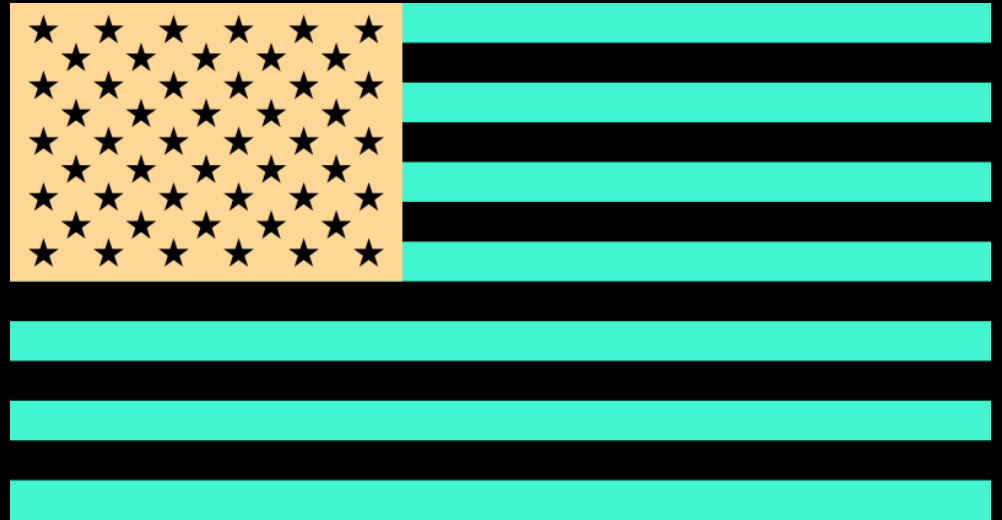


[Zhou et al., Journal of Neuroscience \(2000\)](#)

jasper johns and color opponency

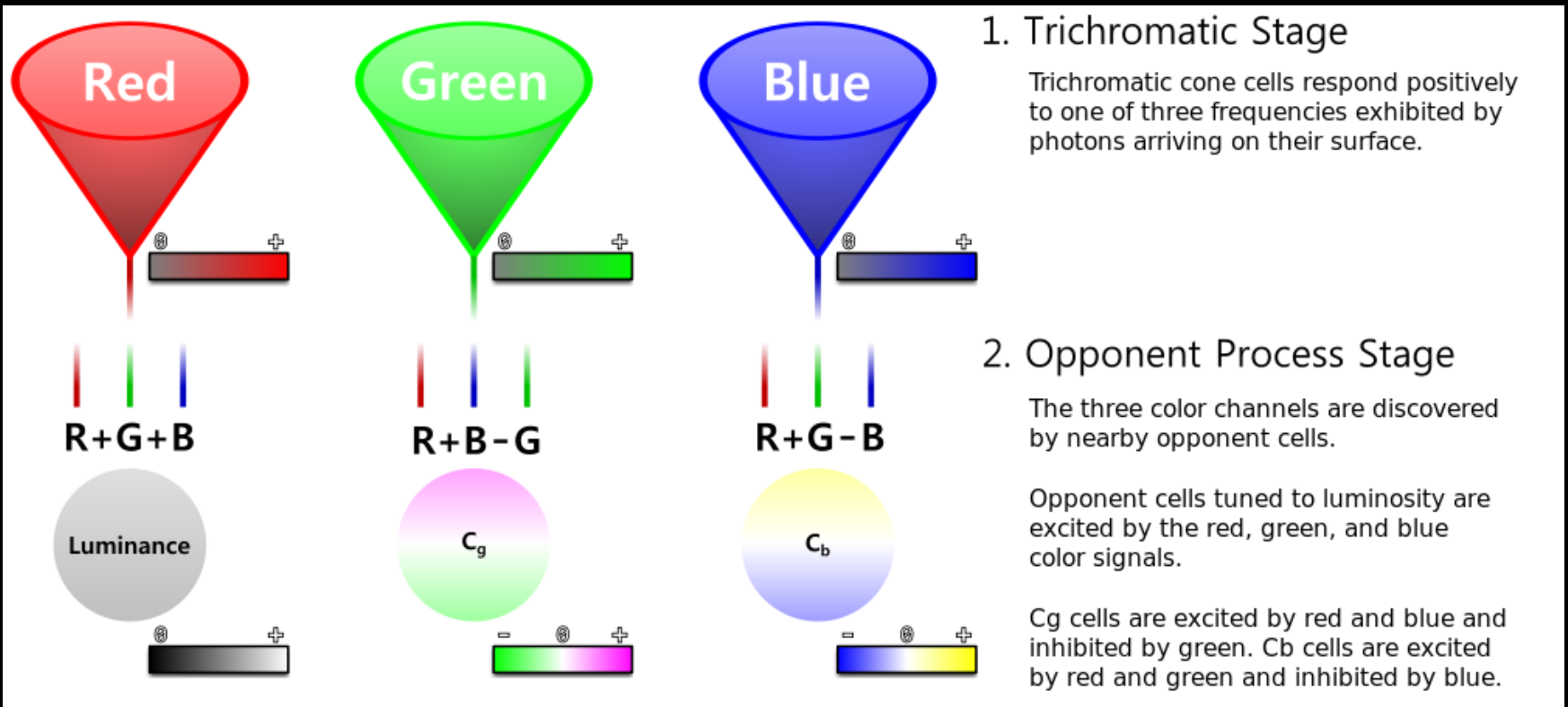


Jasper Johns, Flag (Moratorium), 1969

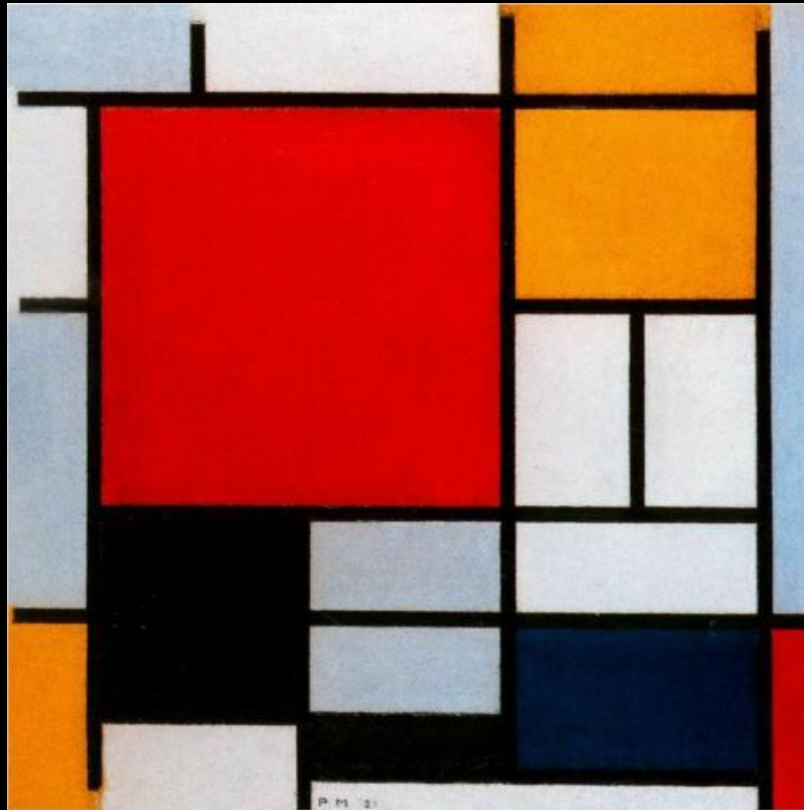


Wikipedia

jasper johns and color opponency

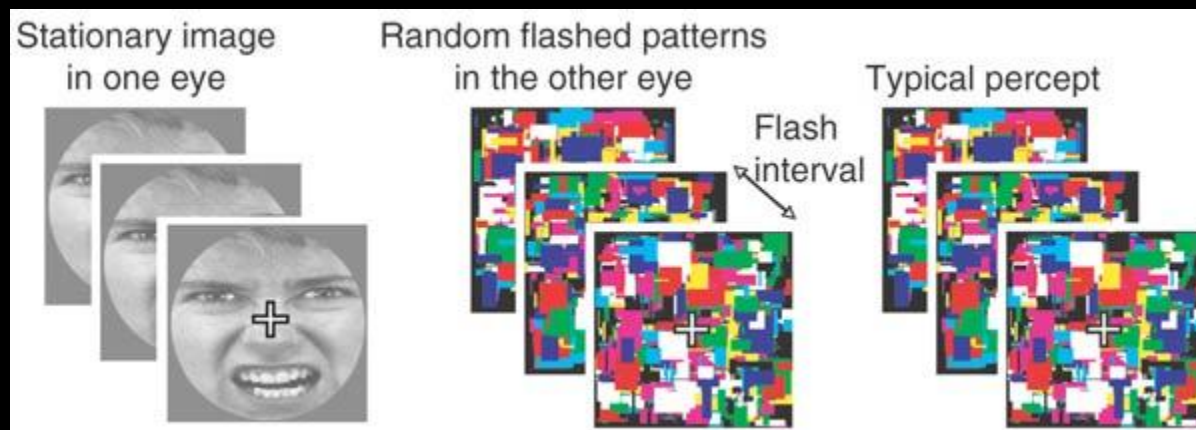


mondrian and non-conscious visual processing

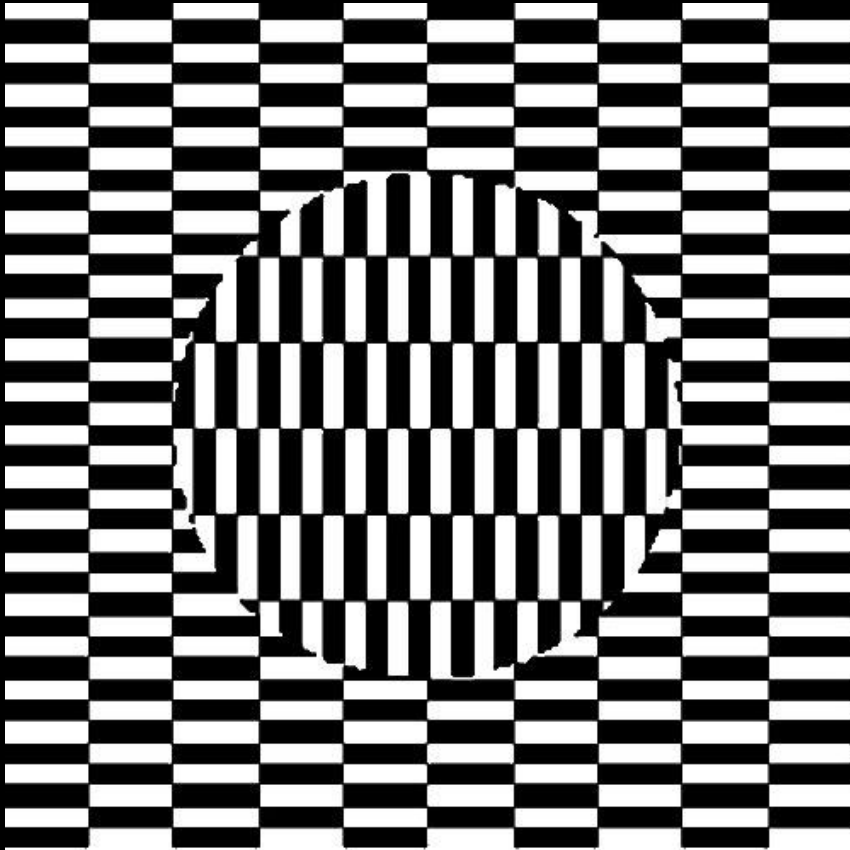


Piet Mondrian, Composition with Large Red Plane, Yellow,
Black, Grey and Blue, 1921

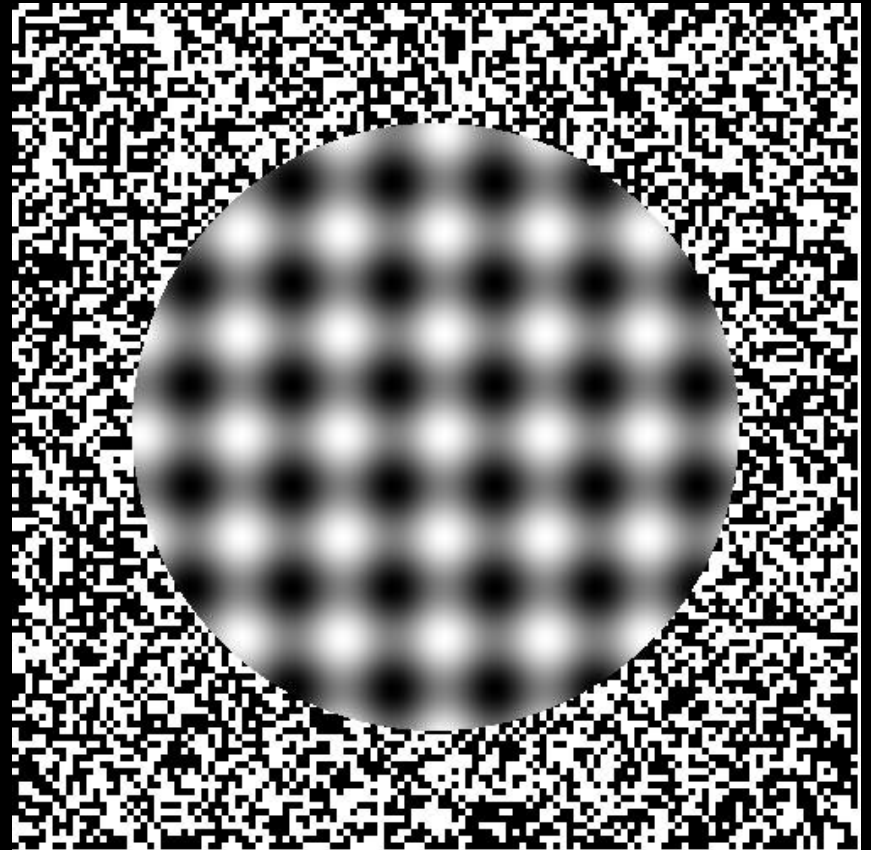
mondrian and non-conscious visual processing



op art and microsaccades



[Hajime Ouchi, *The Ouchi Illusion* \(1973\) | Scientific American](#)



[Akiyoshi Kitaoka, *The Ouchi Illusion* | Scientific American](#)

THANKS