Jacques Bertin

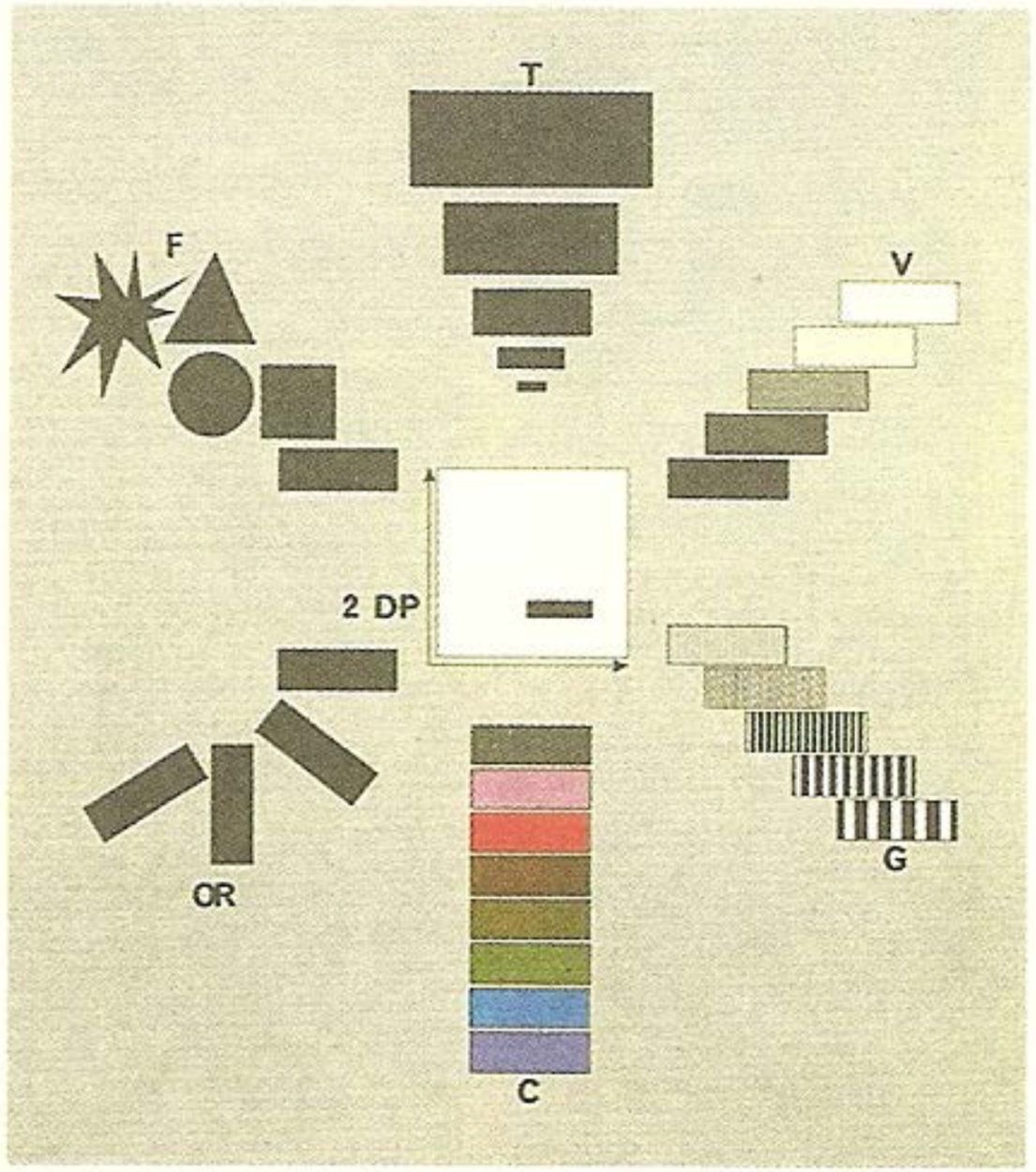
and the Seven Variables

‘Retinal Variables’

from *Semiologie Graphique (1967)*

Size

Shape



Value

Orientation

Texture

Color

The Semiology of Graphics: Diagrams, Networks, Maps Jacques Bertin (1967)

Group Distinguish Sort Count

Size

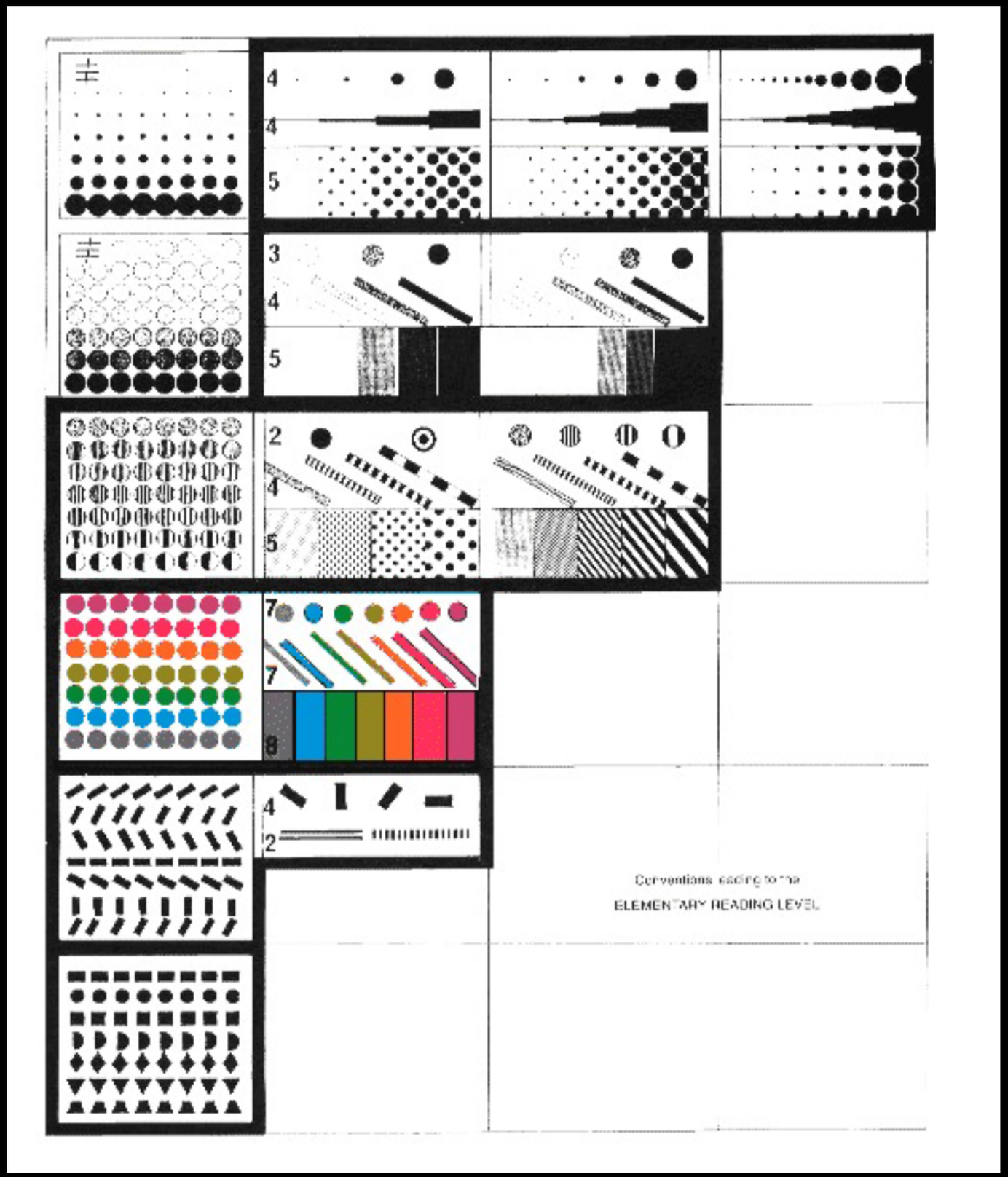
Value

Texture

Color

Orientation

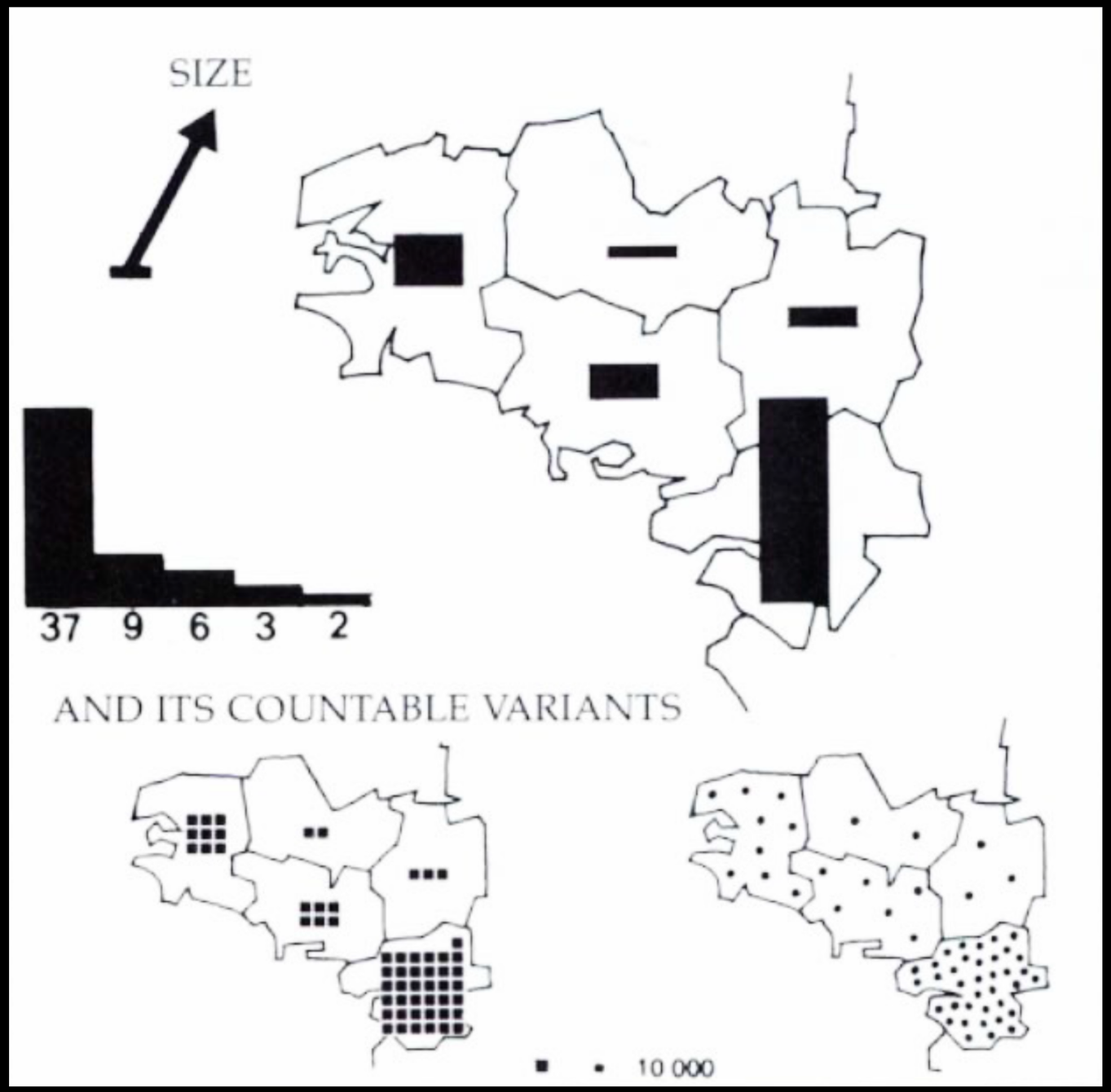
Shape



The Semiology of Graphics: Diagrams, Networks, Maps Jacques Bertin (1967)

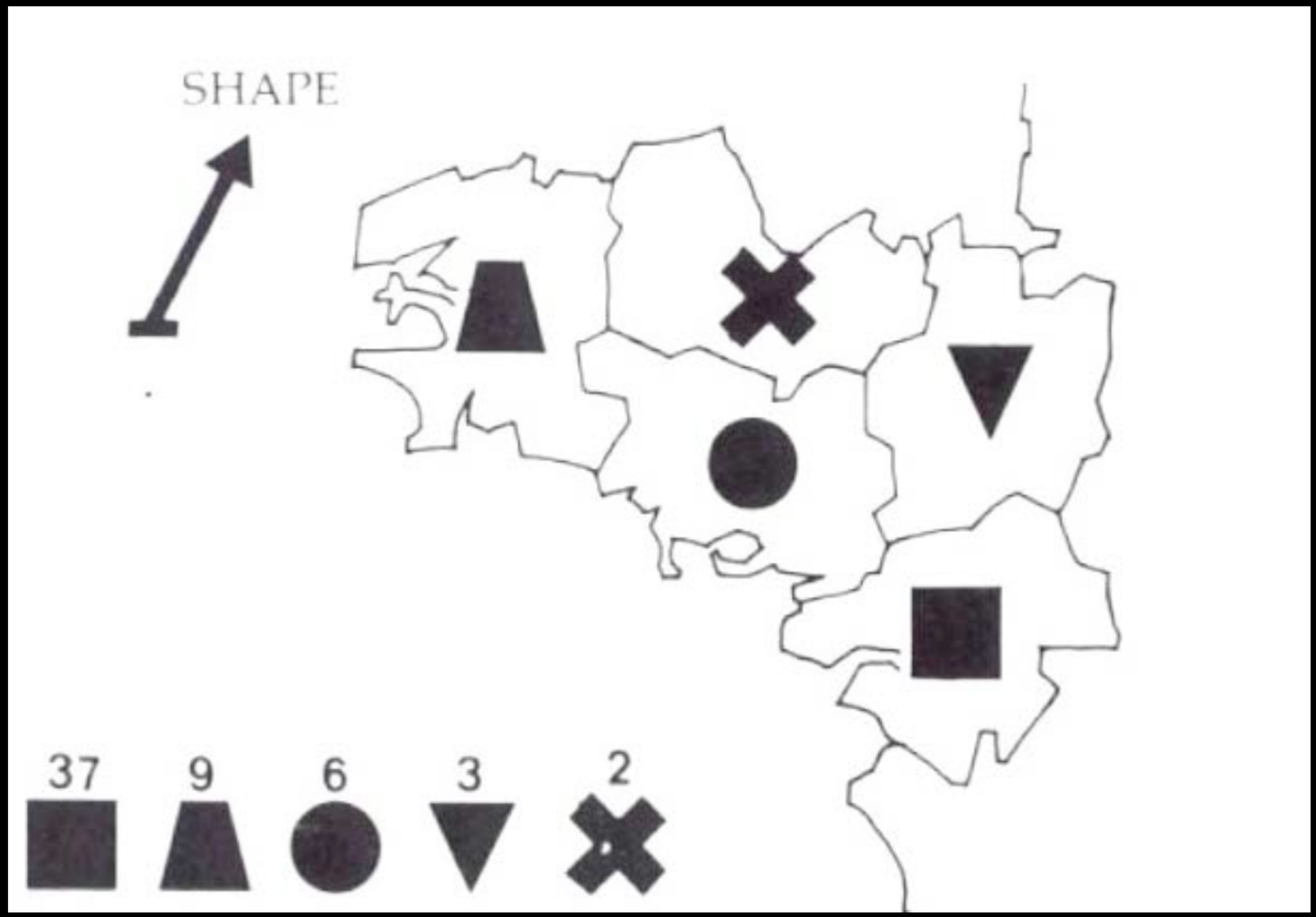
Retinal Variable: Size

Parameters
height
area
count



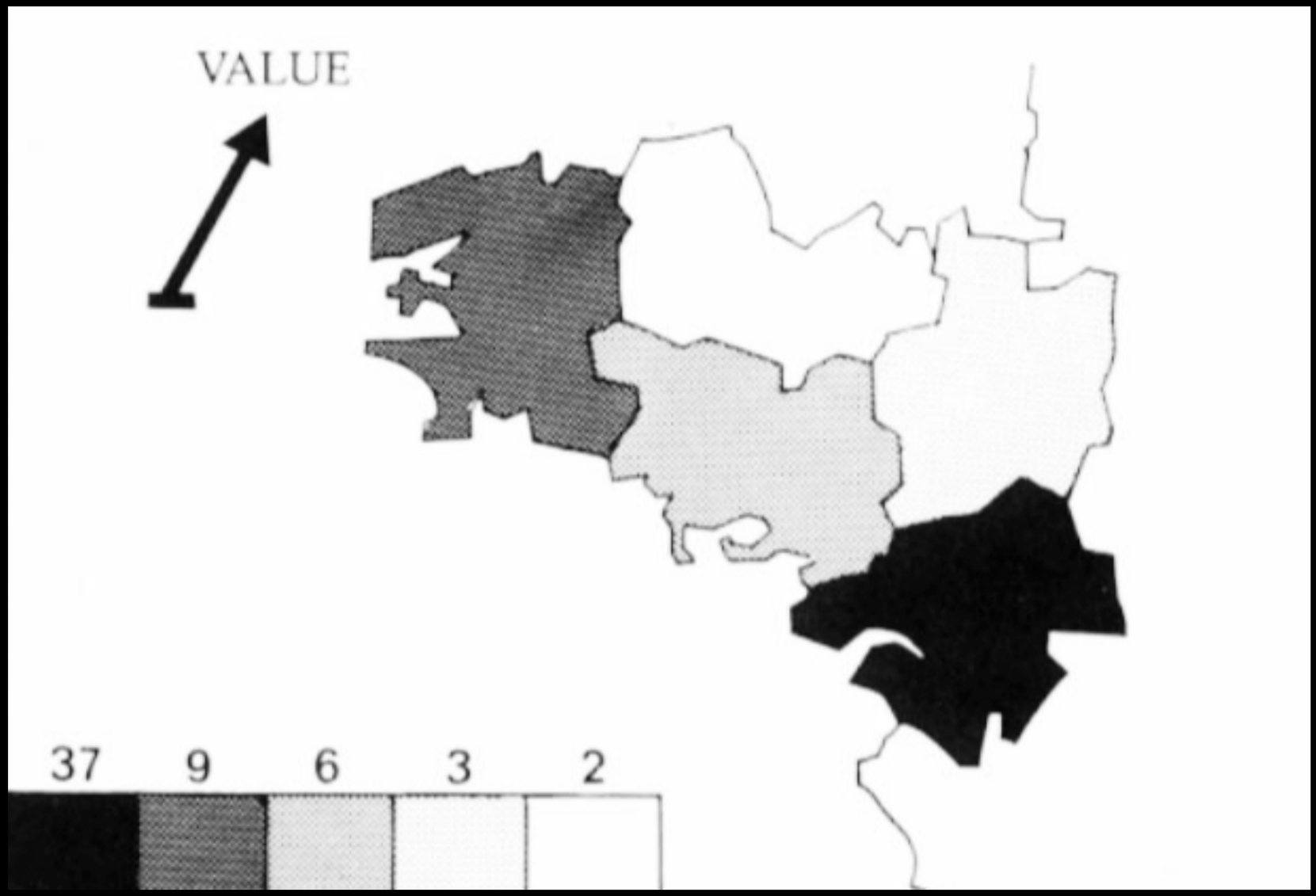
Retinal Variable: Shape

Parameters
outline
associated information in legend



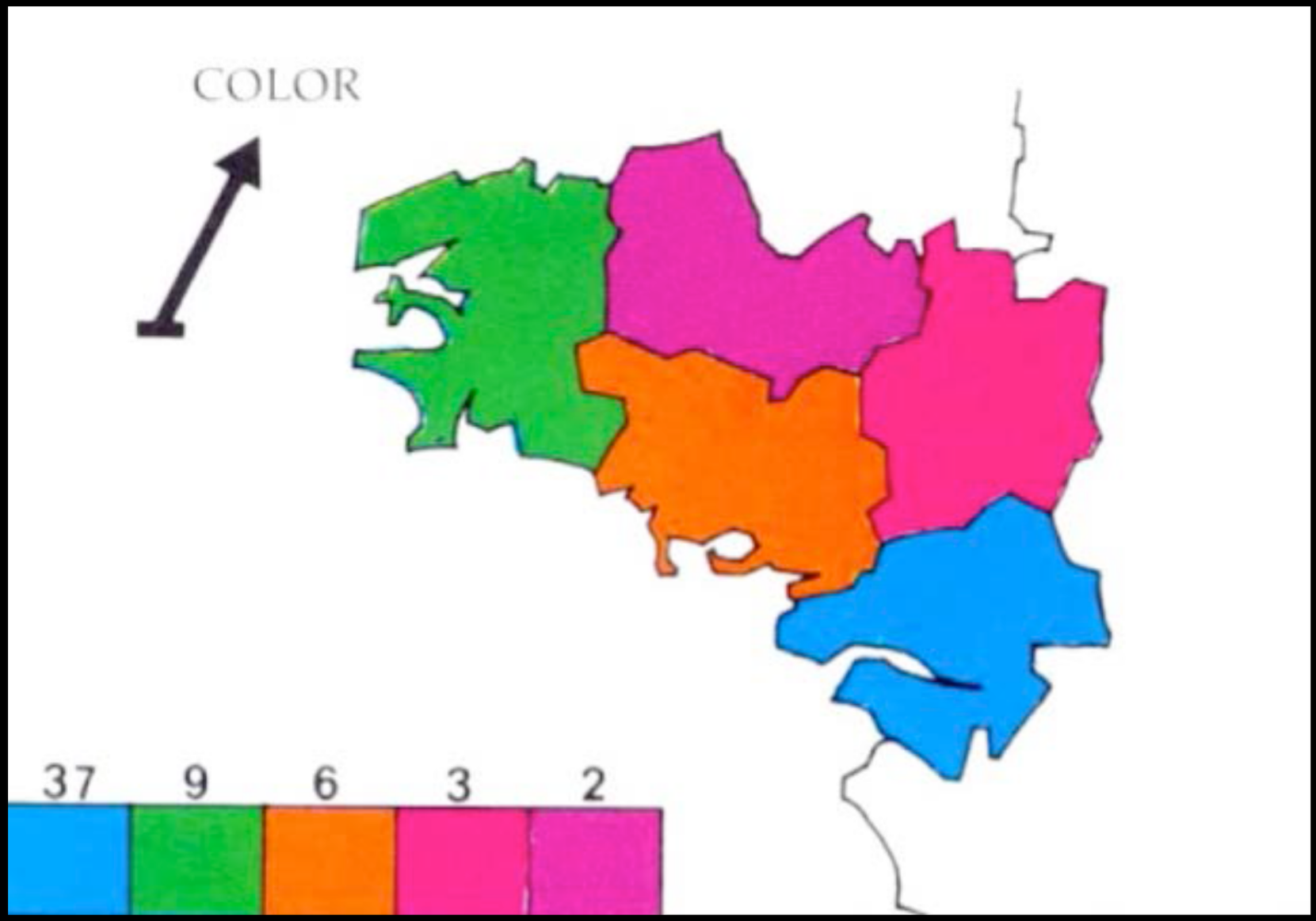
Retinal Variable: Value

Parameters
greyscale lightness



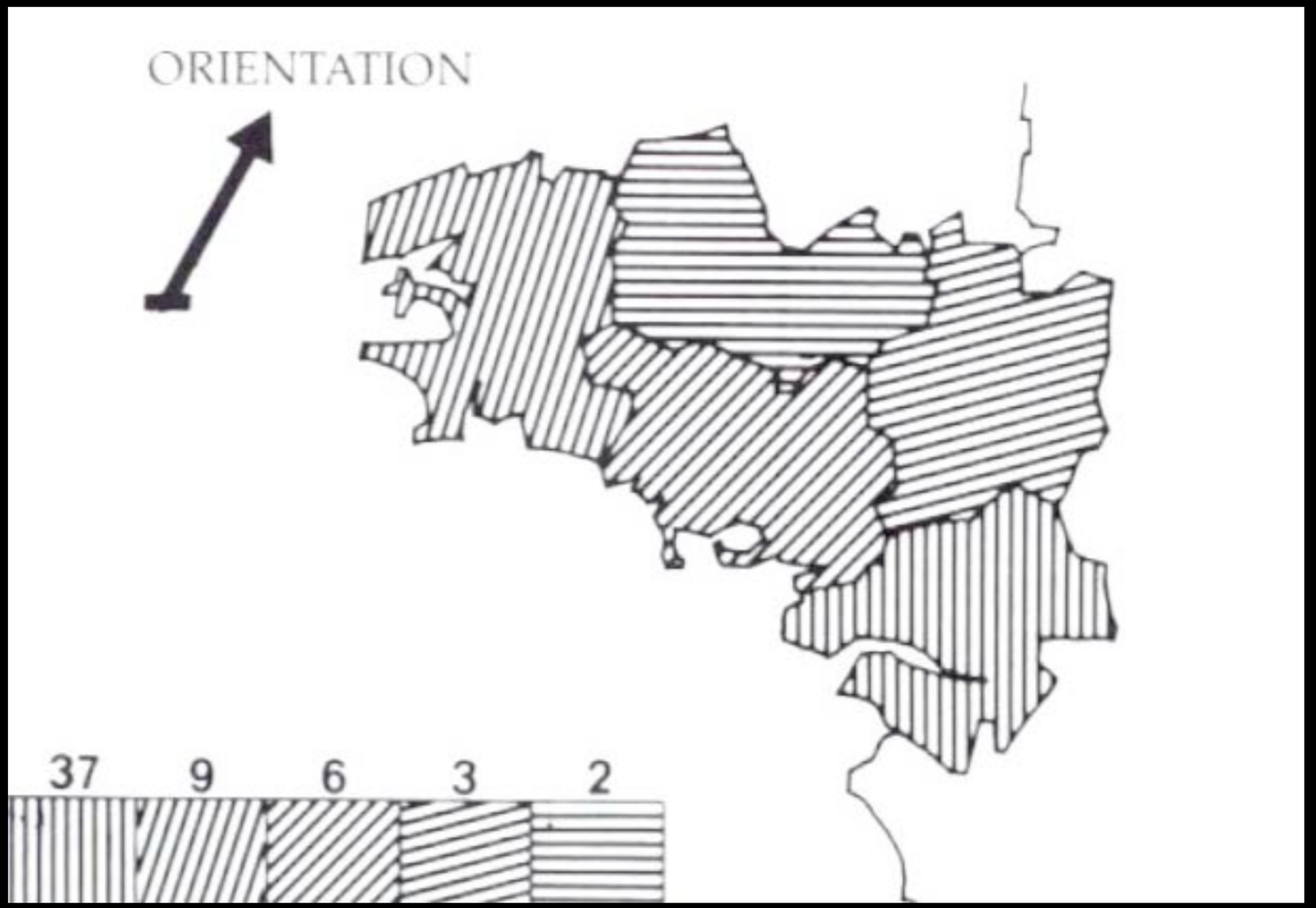
Retinal Variable: Color

Parameters
equiluminant hue differences



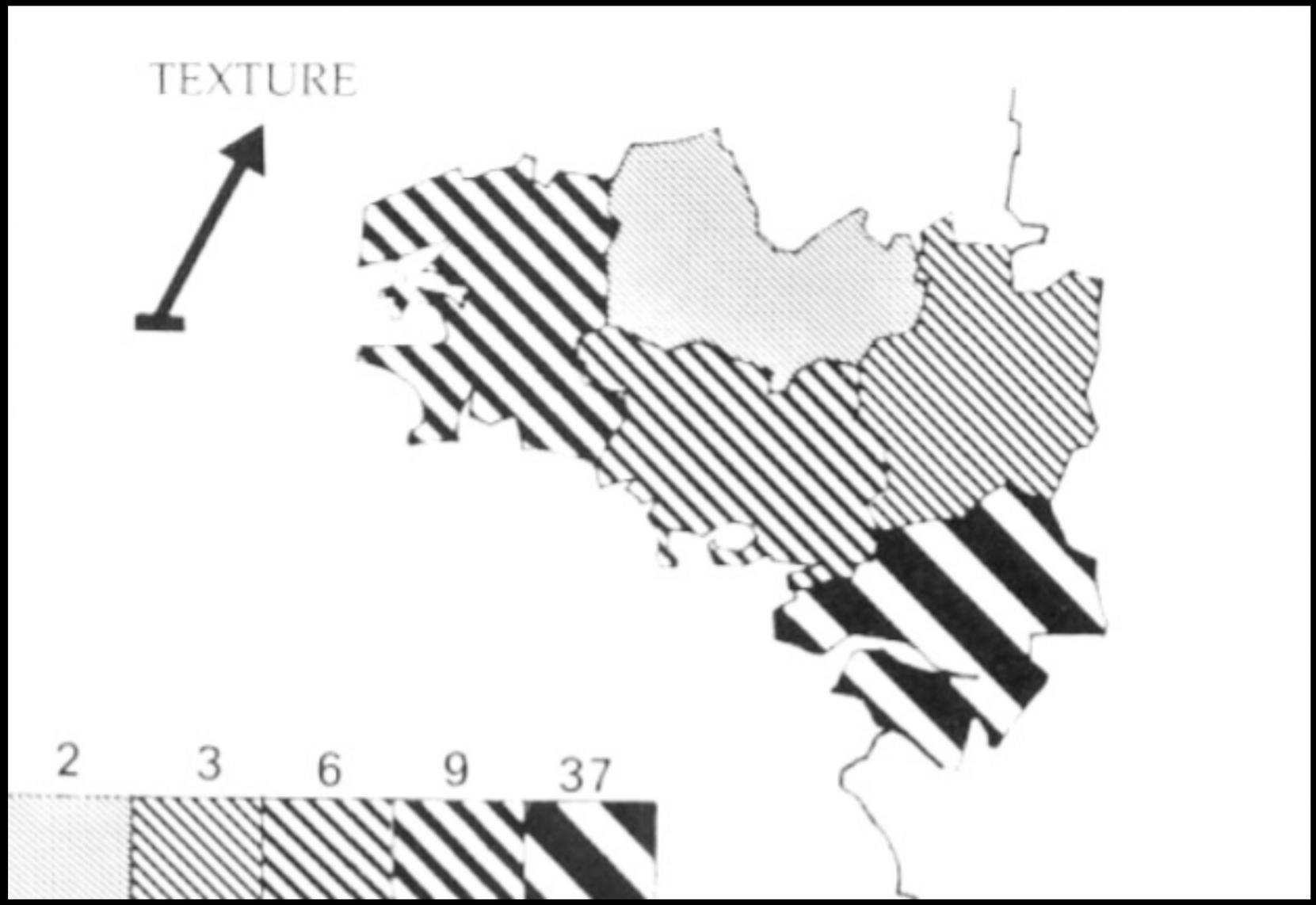
Retinal Variable: Orientation

Parameters
variation from horizontal ↔ vertical



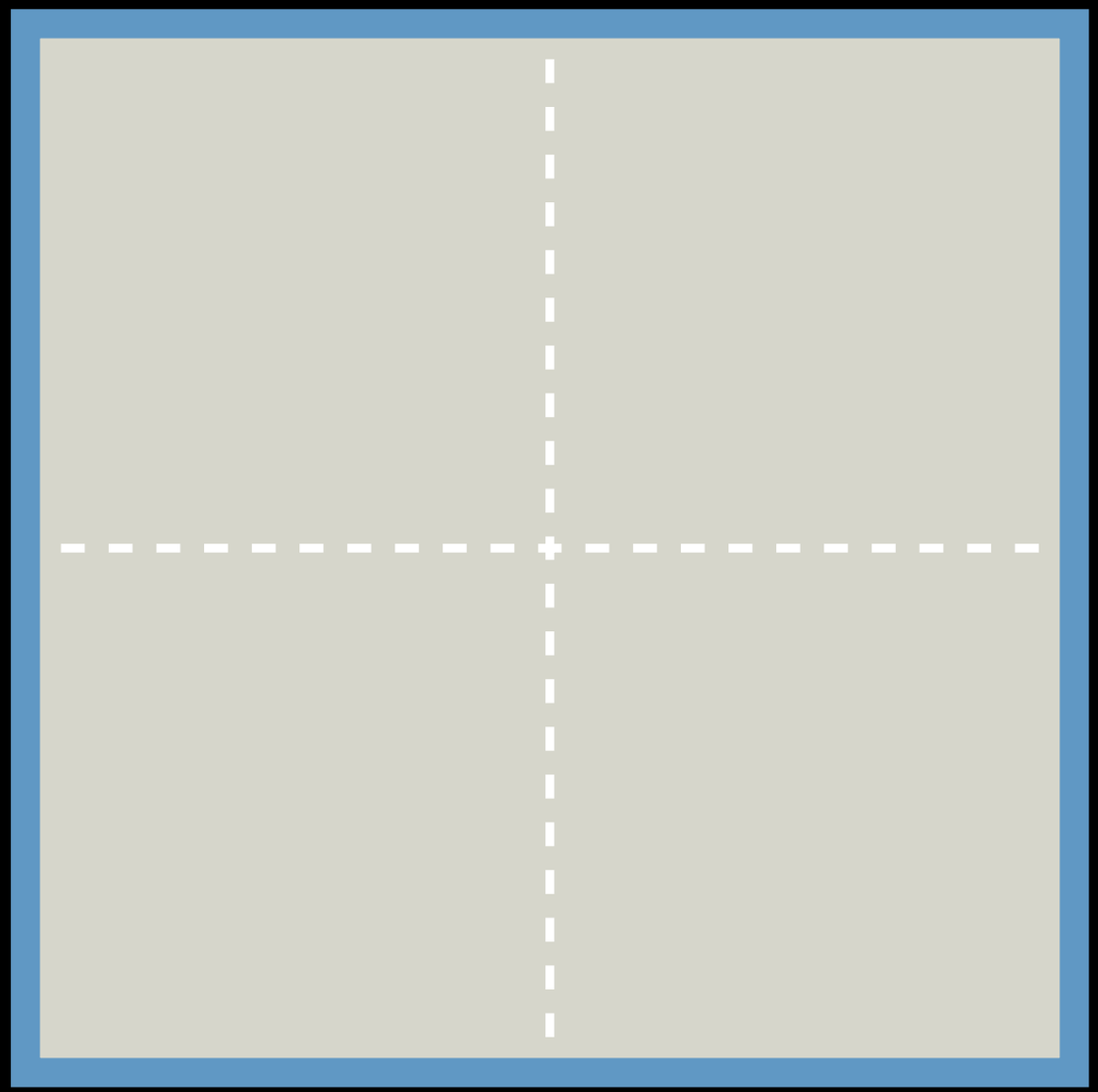
Retinal Variable: Texture

Parameters
stroke weight
spatial frequency



Retinal Variable: The plane

Parameters
origin
x, y, and ‘z’ axes



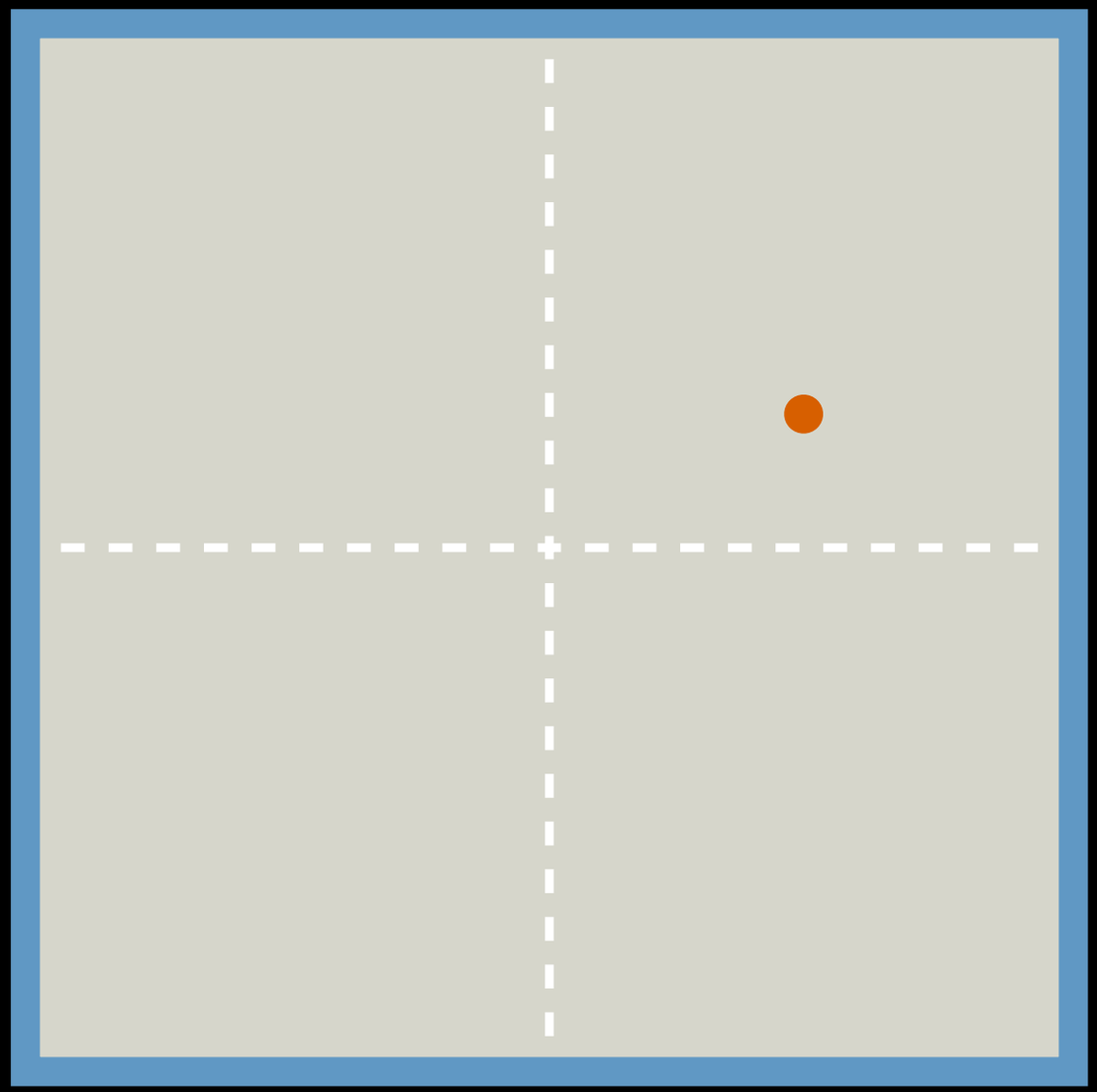
Retinal Variable: The plane

Points

"A point represents a location on the plane that has no theoretical length or area. This signification is independent of the size and character of the mark which renders it visible."

Can represent:
a position in 2D space
an entity with a pair of abstract values

Can vary in:
thickness
color & value
texture



Retinal Variable: The plane

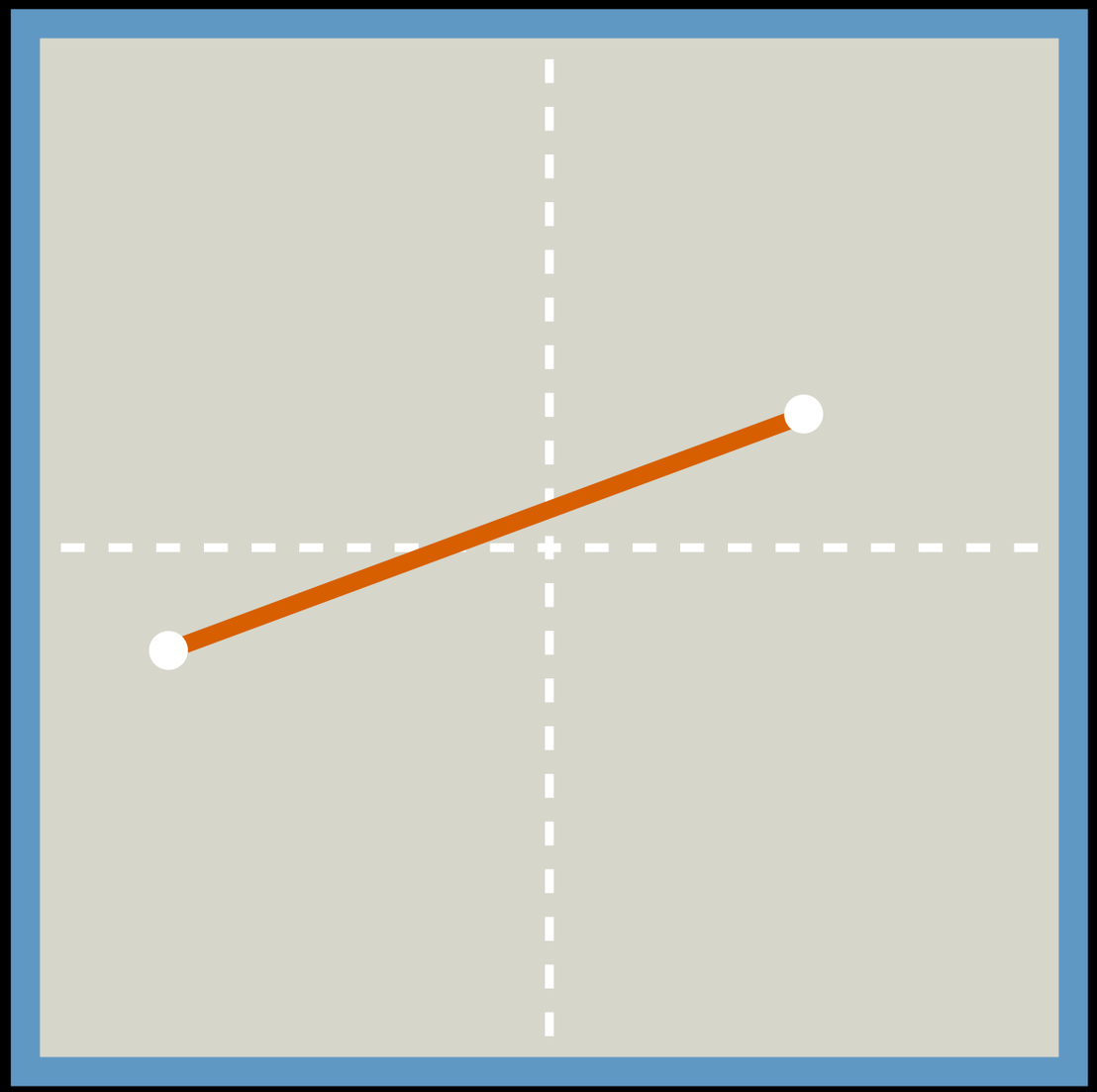
Lines

"A line signifies a phenomenon on the plane which has measurable length but no area. This signification is independent of the width and characteristics of the mark which renders it visible."

Can represent:
a connection
a boundary

Can vary in:
thickness
color & value
texture

Must keep constant:
positions of endpoints



Retinal Variable: The plane

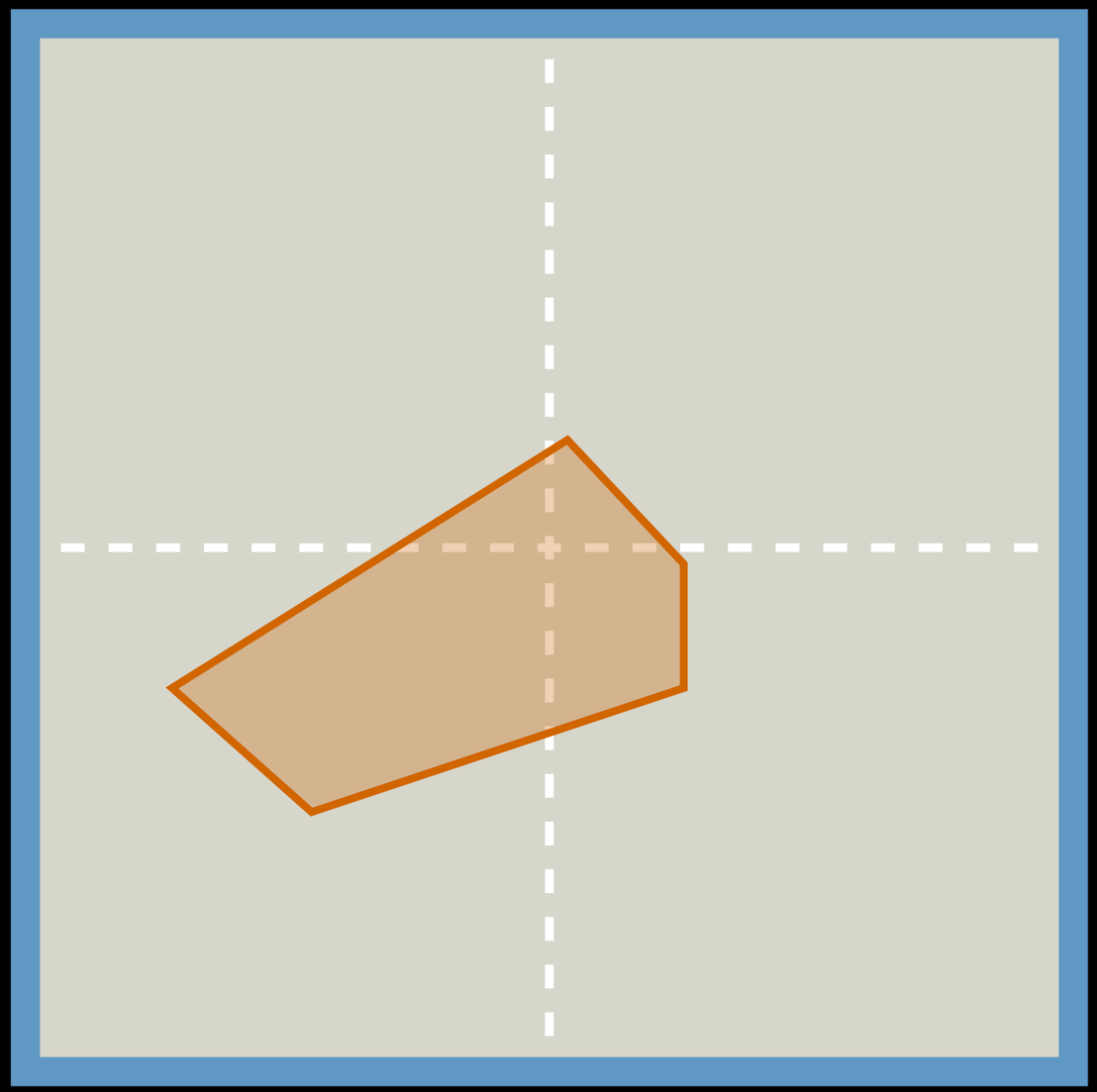
Areas

"An area signifies something on the plane that has measurable size. This signification applies to the entire area covered by the visible mark."

Can represent:
a quantity of variation in each dimension
a categorical grouping of points

Can vary in:
position

Must keep constant:
size
shape
orientation



Retinal Variable: The plane

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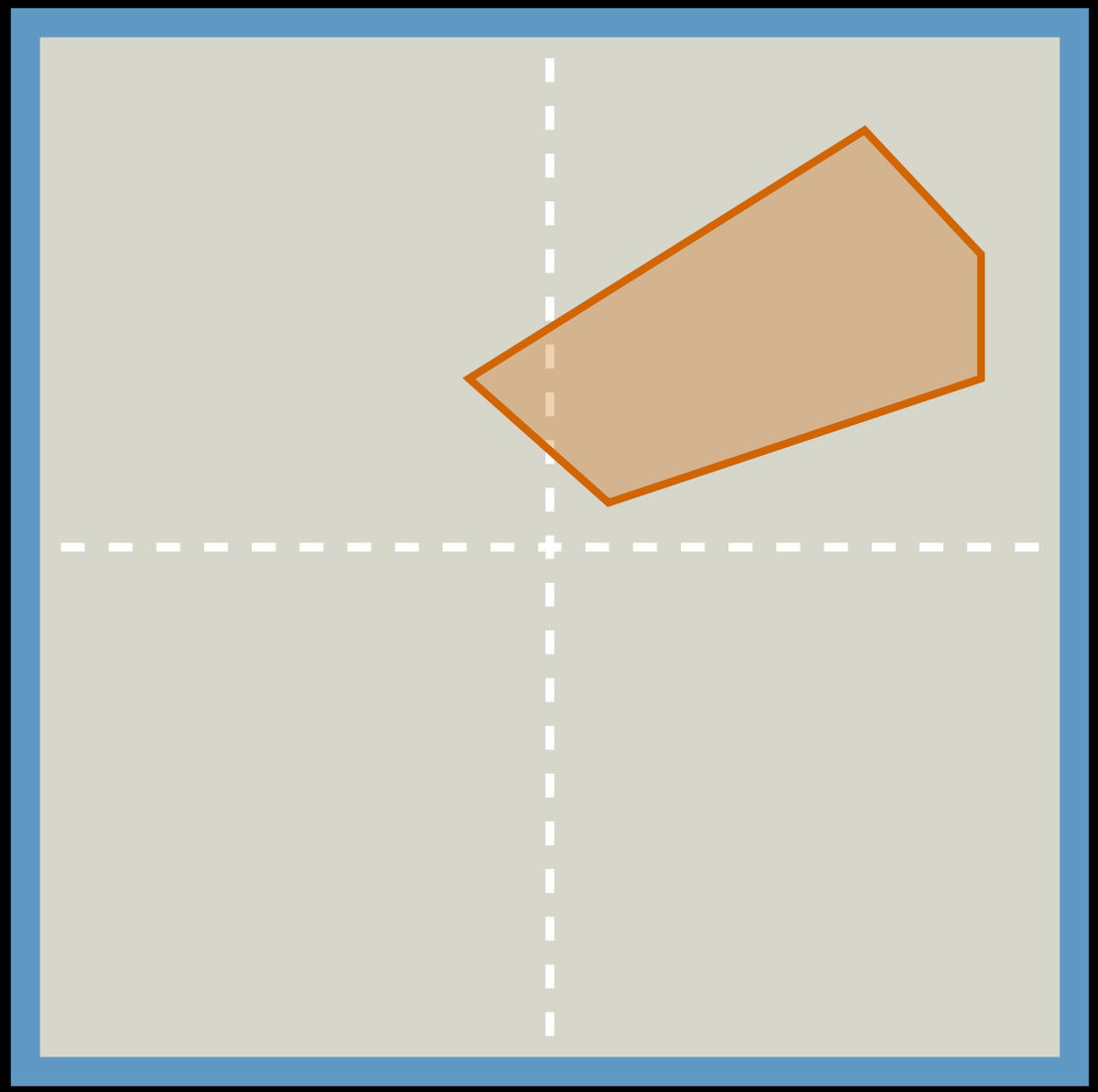
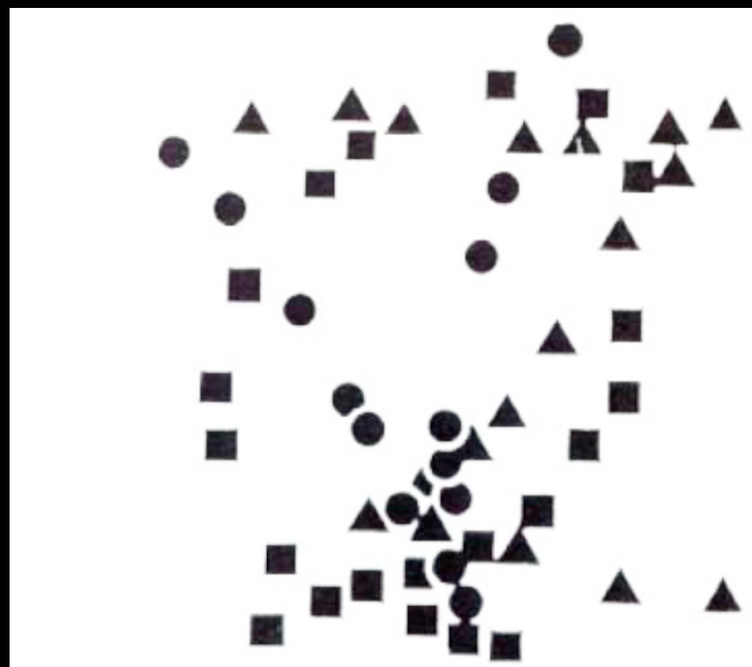


Variables on the plane

Retinal Variable: Size

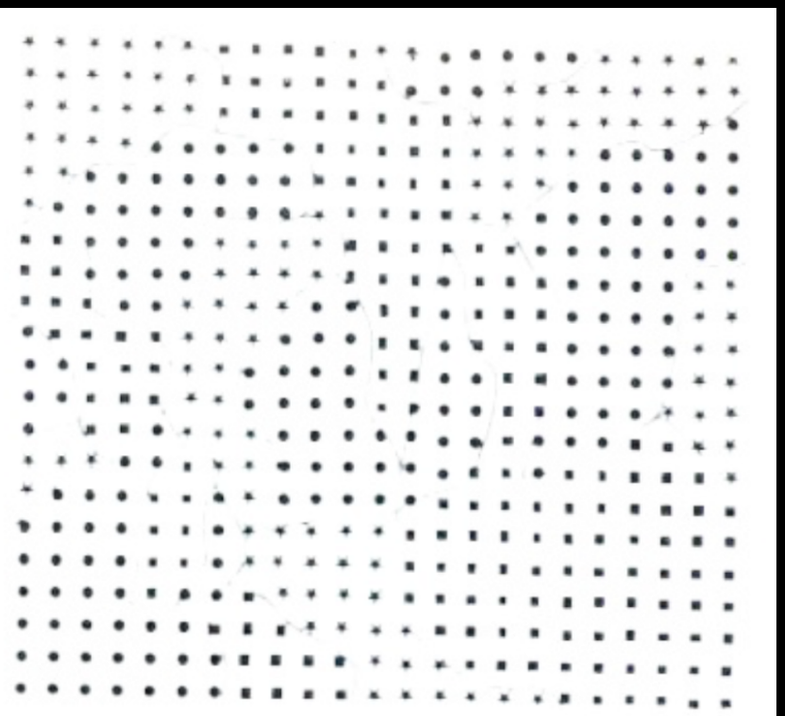
points lines areas

Retinal Variable: Shape



points

lines



areas

Retinal Variable: Value

points lines areas

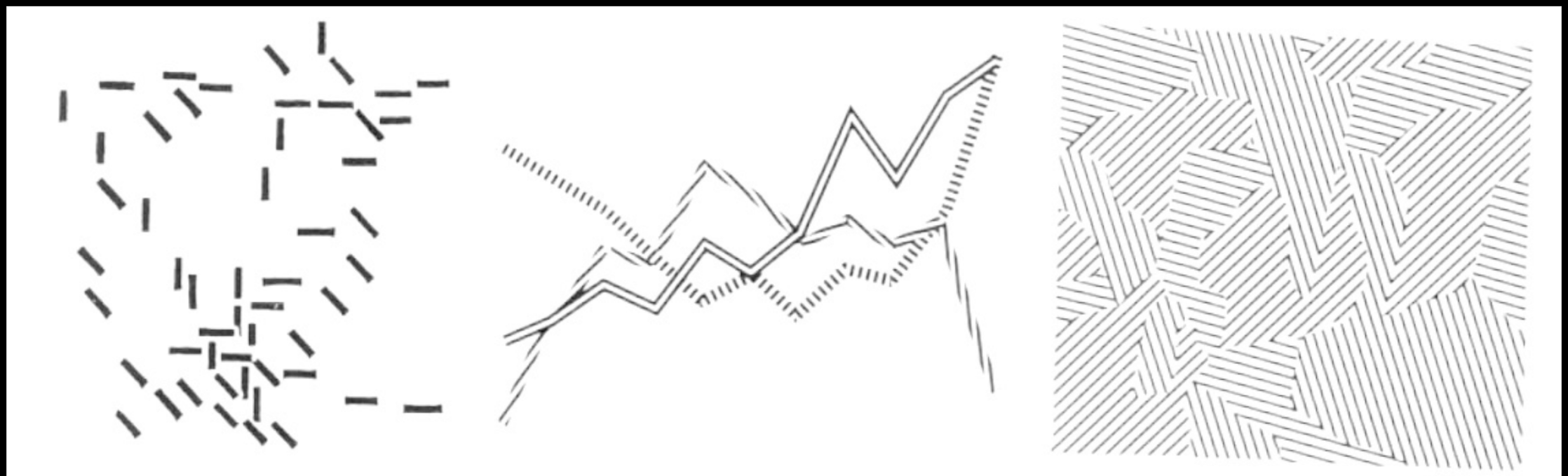
Retinal Variable: Color

points

lines

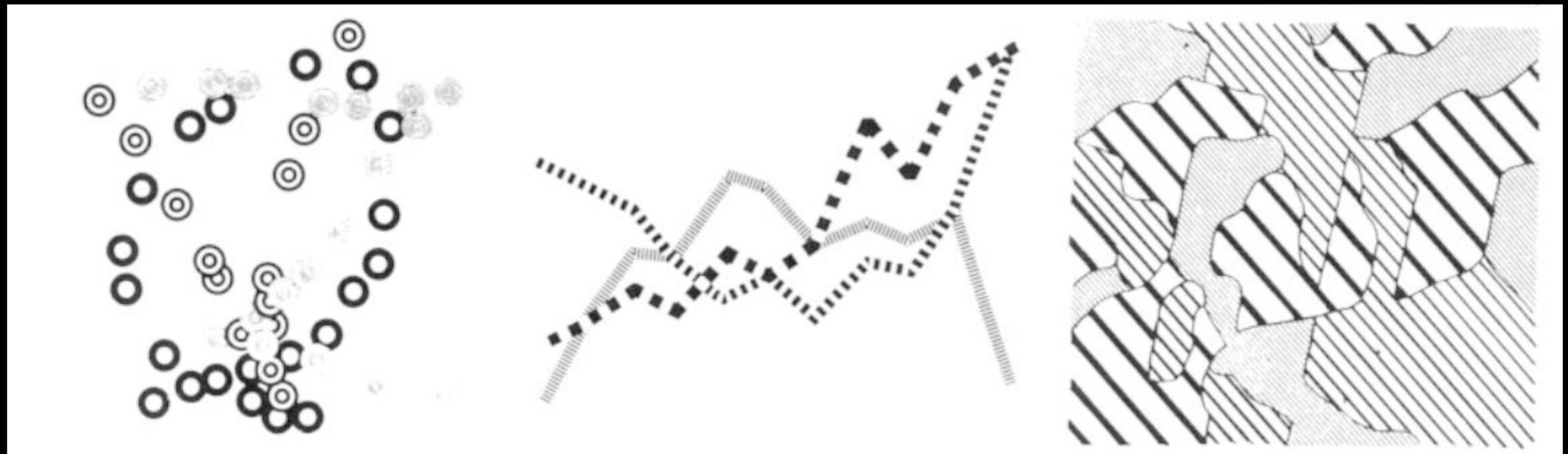
areas

Retinal Variable: Orientation



points lines areas

Retinal Variable: Texture



points lines areas

Now it’s your turn…

RETINAL VARIABLES		QUANTITIES				
		1	5	10	50	100
Position	version 1					
	version 2					
Shape	v. 1					
	v. 2					