

# VISION AND FOOD APPEARANCE

Jiangnan University  
Fang Zhong



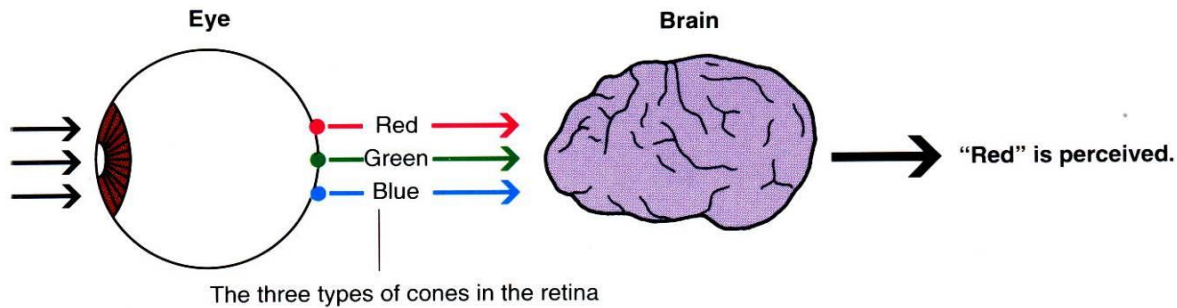


# FOOD COLOR & APPEARANCE

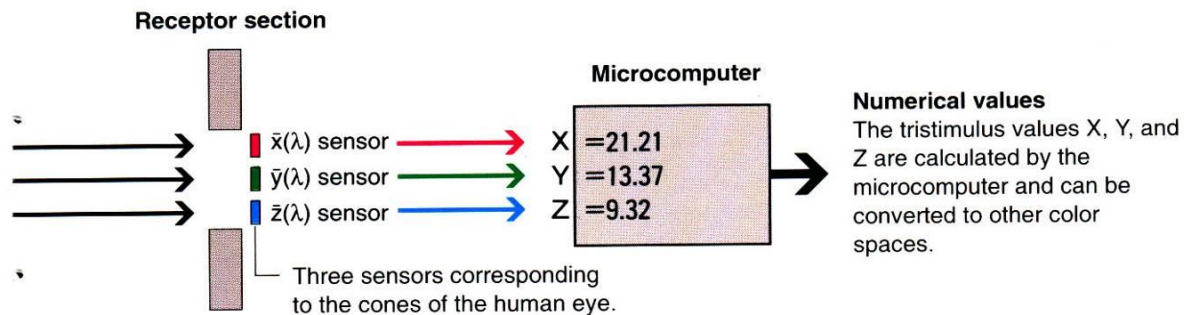
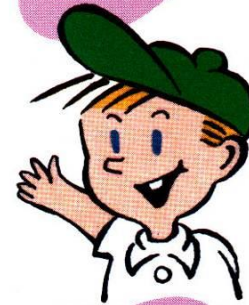
*Visual structure, color,  
translucency,  
gloss, surface texture*



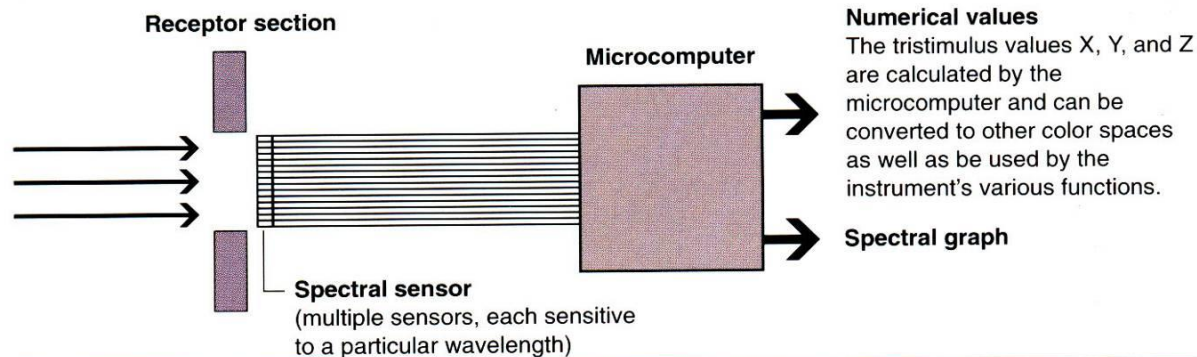
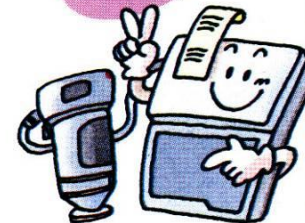




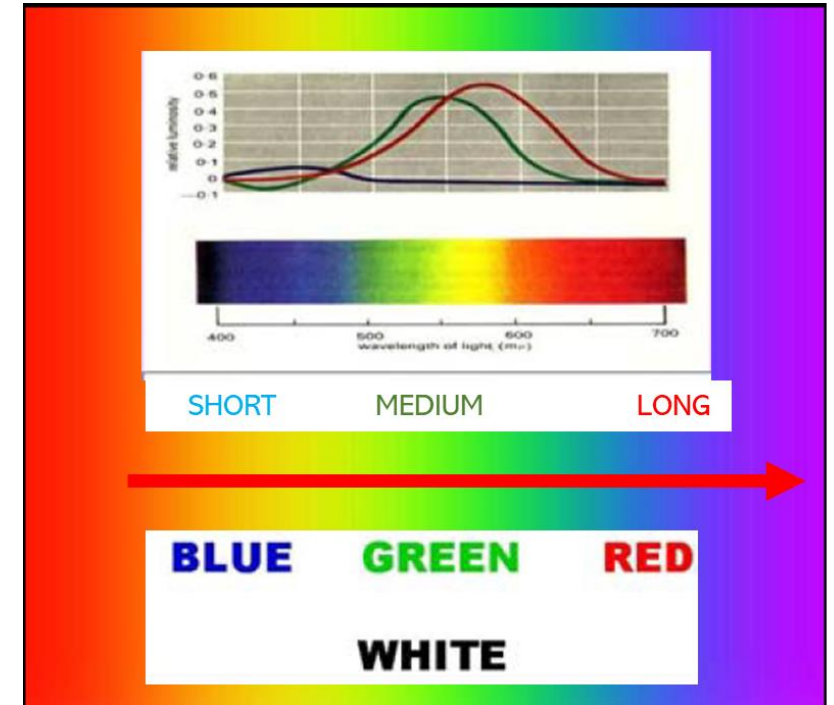
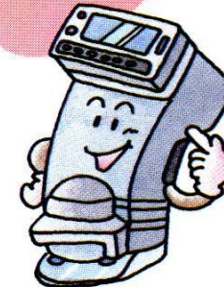
This is how I see color of the apple.



This is how I measure color. It's basically the same as the human eye.



I provide more accurate measurements with my multiple sensors.



# COLOR PERCEPTION

## DEFINITIONS

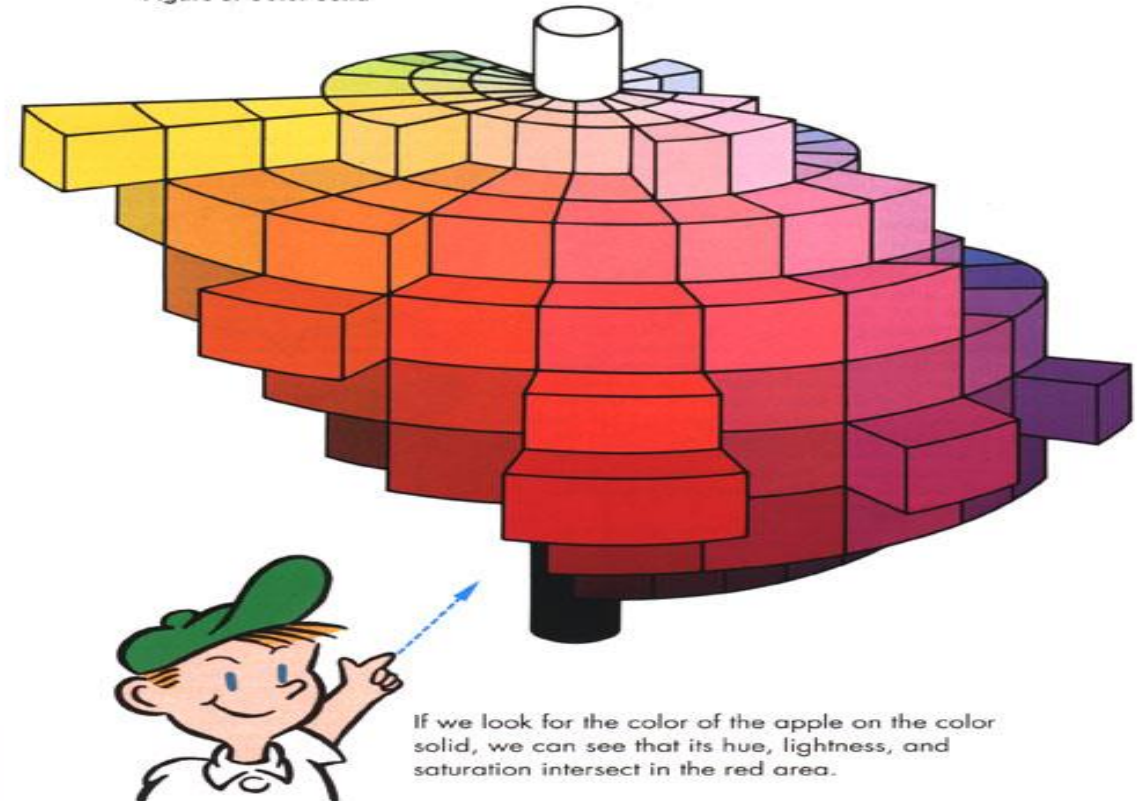
**SATURATION**      deepness of color  
**RED** is more saturated  
than **PINK**      pastel colors

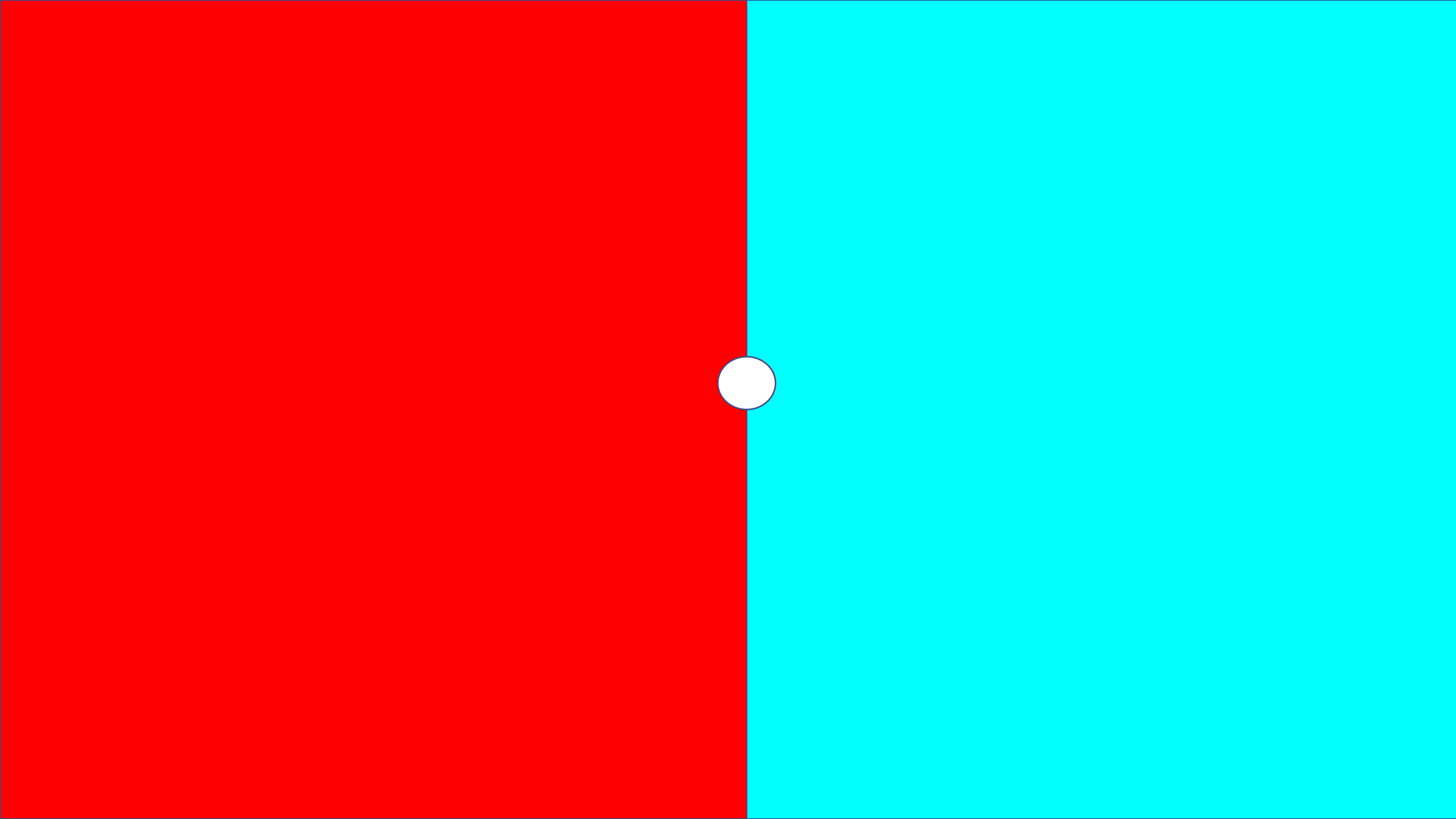
**HUE**              actual color  
**RED** versus **BLUE**

**INTENSITY**      brightness of color

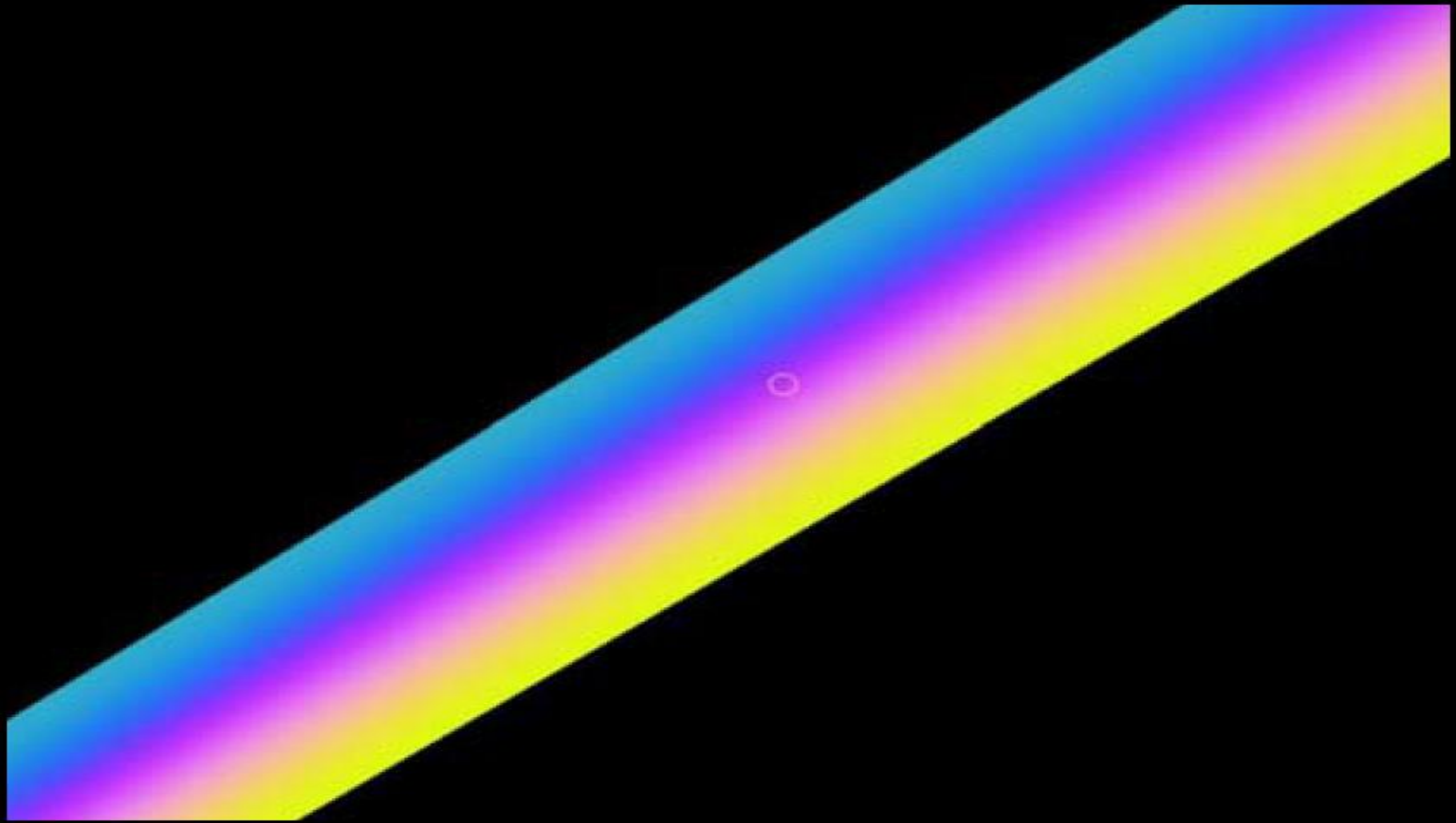
**Cannot describe hues (colors) precisely.  
So use color charts.  
Match the color to a color plate on the chart.**

Figure 5: Color solid









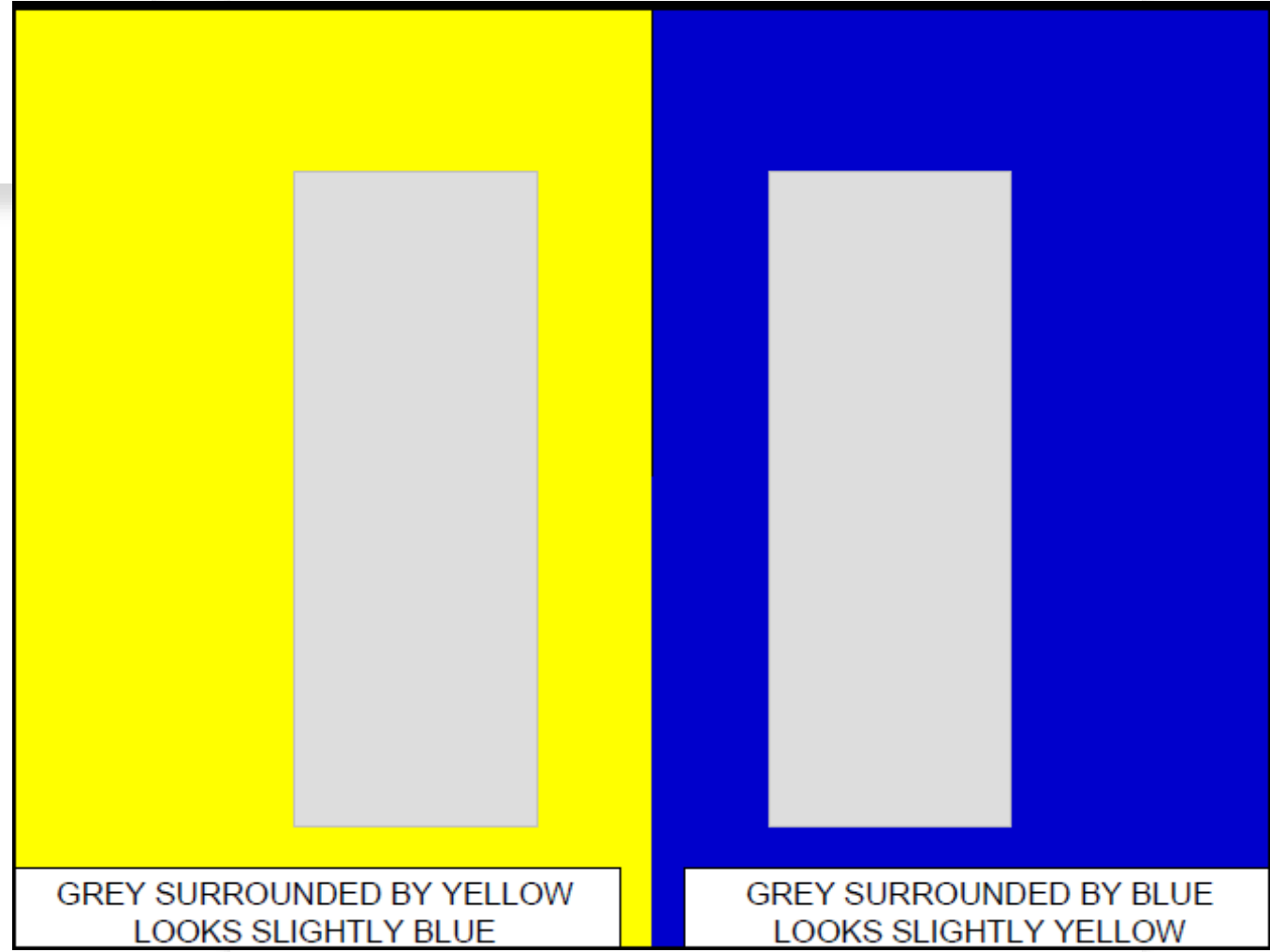




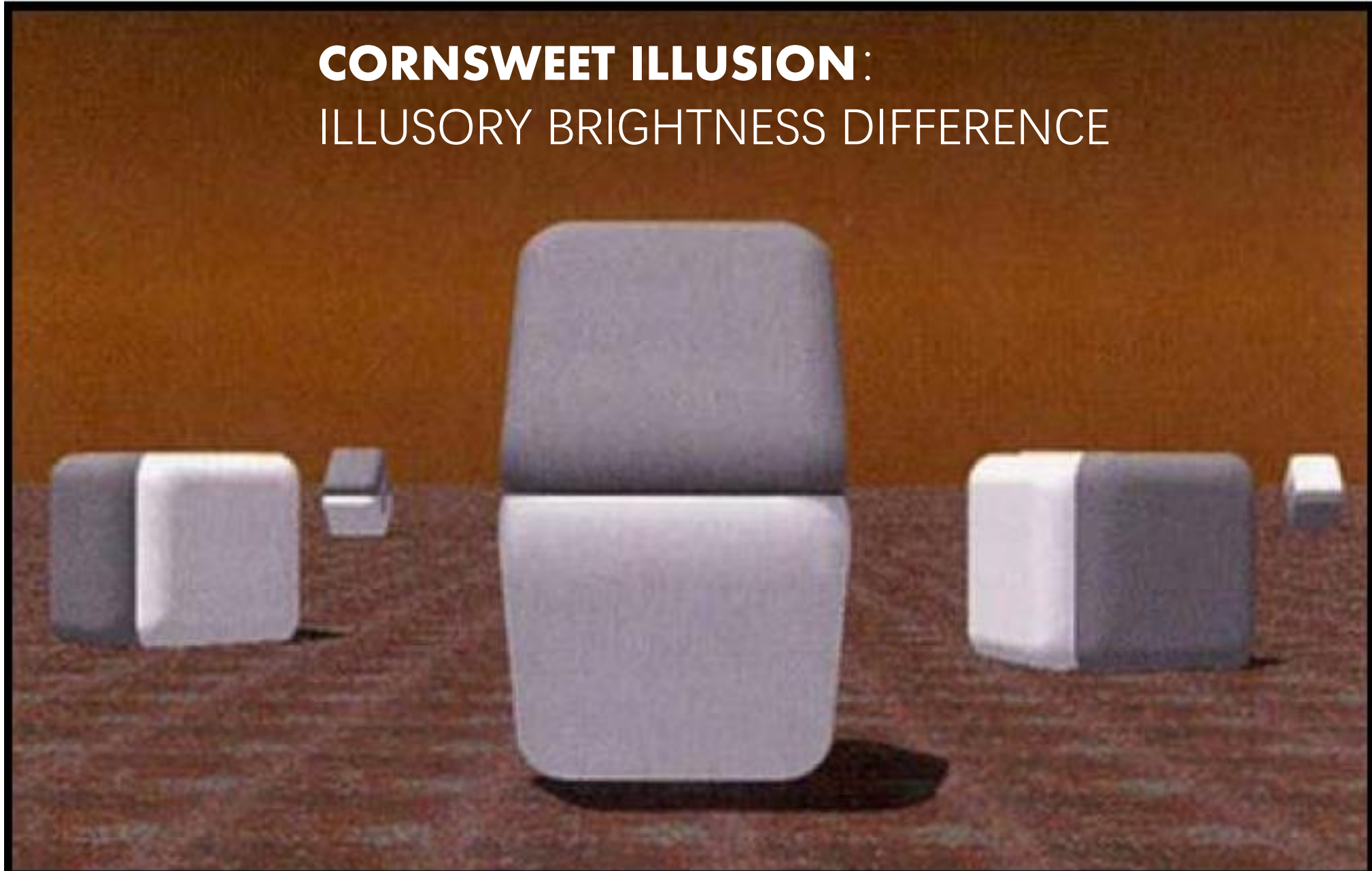
# LATERAL INHIBITION

COLOR  
RECEPTORS RODS

RED GREEN BLUE



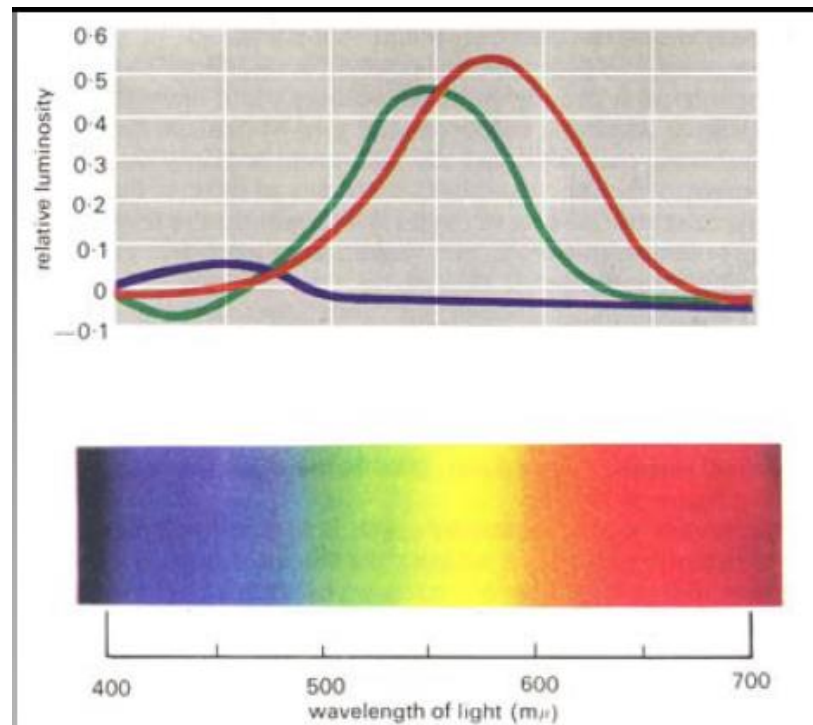
# **CORNSWEET ILLUSION:** ILLUSORY BRIGHTNESS DIFFERENCE



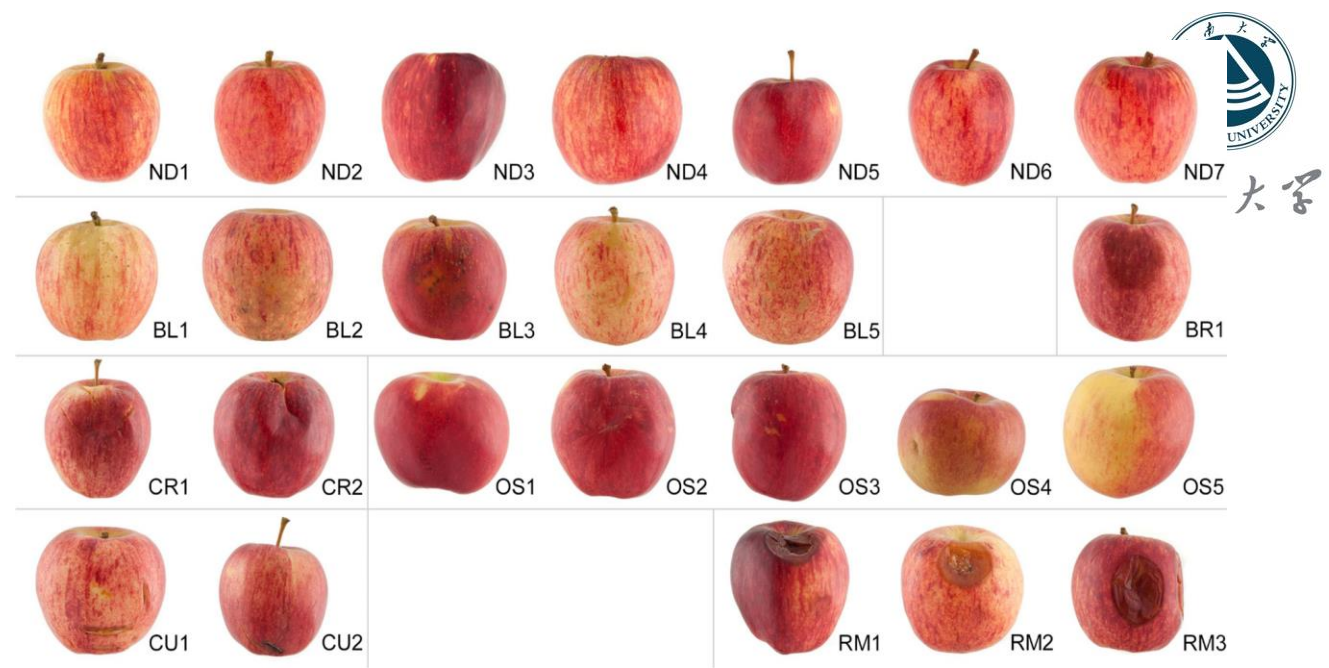
THE GREY COLORS IN THE MIDDLE FIGURE ARE IDENTICAL.  
THE ILLUSION IS TRIGGERED BY THE NARROW DARK AND LIGHT LINES AT THE EDGE.

# FOOD COLOR

- Red fruits:
  - Go, eat it!
- Green fruits:
  - Uh, better not







# APPEARANCE

Physical form

- Shape
- Size
- Surface texture
- Congruency



# Expectations, Halo Effects and Taste

- Visually assessed safety ;
- Visual identification;
- Visually assessed usefulness;
- Visually assessed pleasantness,
- Visually assessed satisfaction.



# CROSS-CULTURAL DISPARITIES:

	O'Mahony (1983)	Tomasik-Krótki and Strojny (2008)	Koch and Koch (2003)	The present study
Number of participants	51	519	45	452
Origin of participants	California, USA	17 countries/areas	Oregon, USA	4 countries
Black	Bitter			Bitter
Blue		Salty		
Green	Bitter	Sour	Sour	Sour
Orange		Sweet	Sweet	
Pink	–	–	–	Sweet
Red	Sweet	Sweet	Sweet	
Violet		Bitter/Umami		–
White	Salty		Salty	Salty
Yellow	Sour	Sour	Sour	

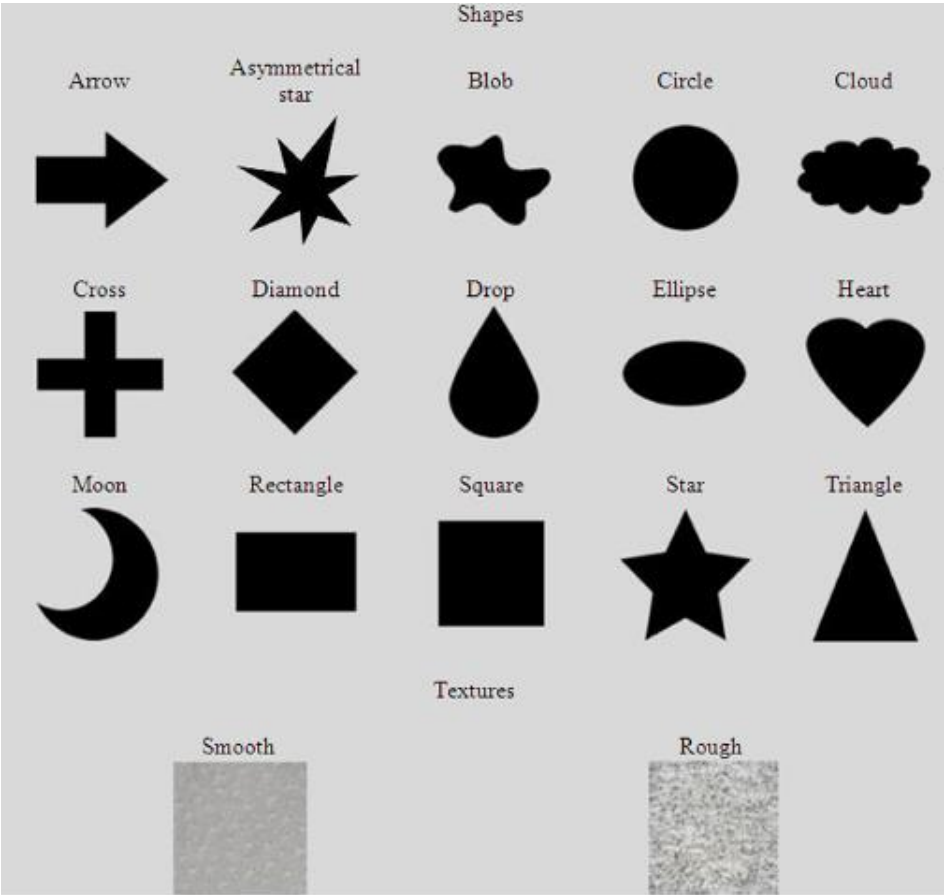
*Note: – denotes that this color was not tested in this study.*

**Matching test between “shapes, surface texture” and “bitterness, saltiness, sourness, sweetness, umami” across China, India, Malaysia, USA”**

11 COLORS:

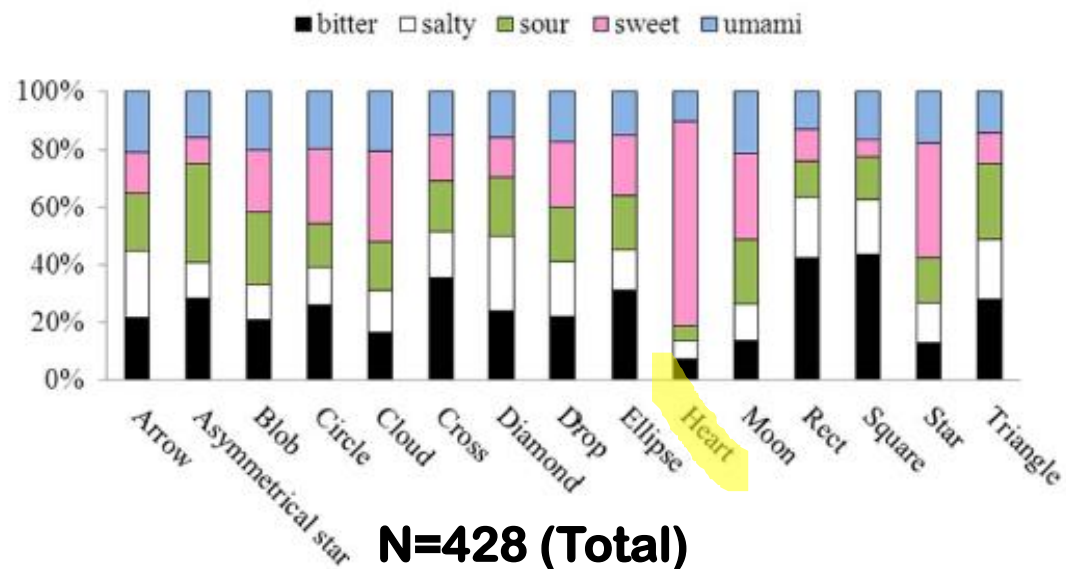
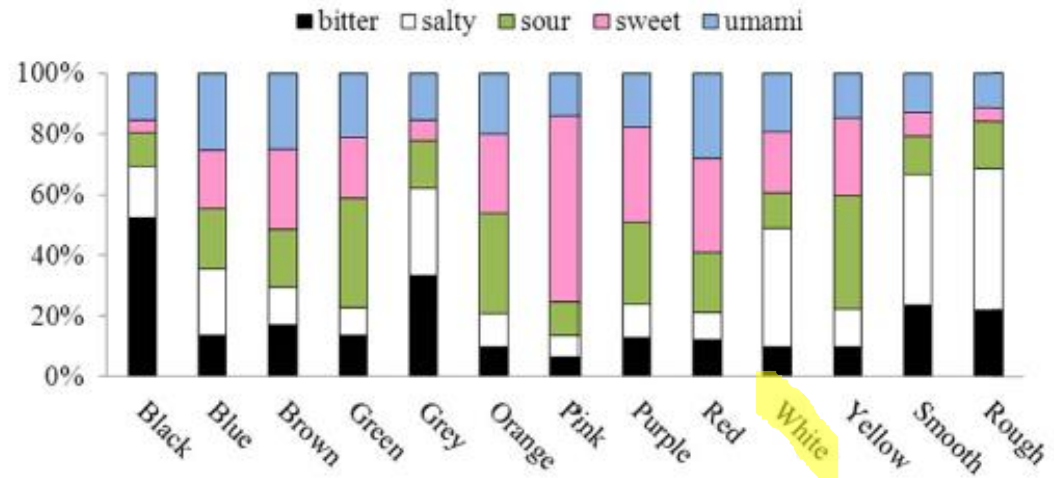
black, gray, blue, brown, green, pink, orange, red, purple, white, yellow

15 SHAPES, 2 TEXTURES:

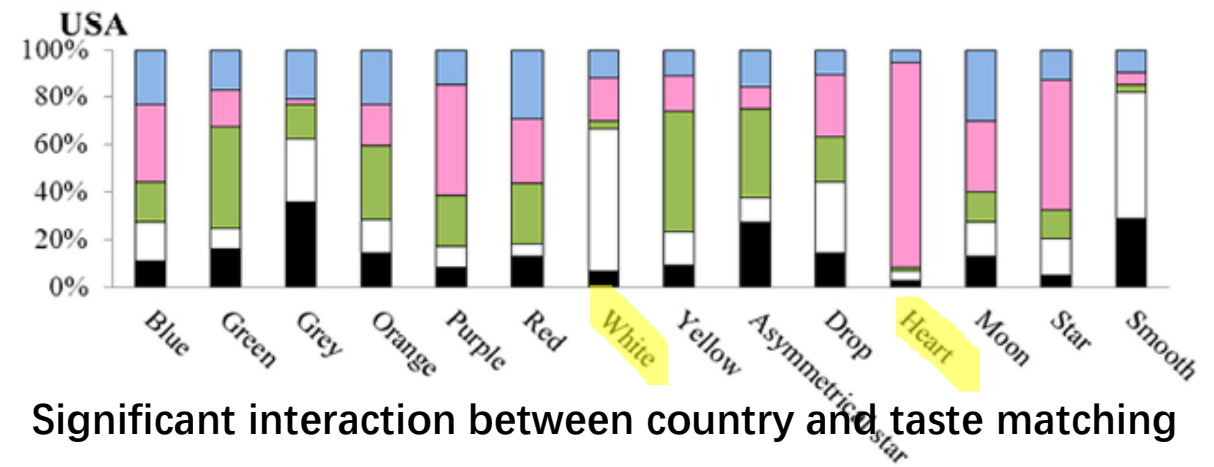
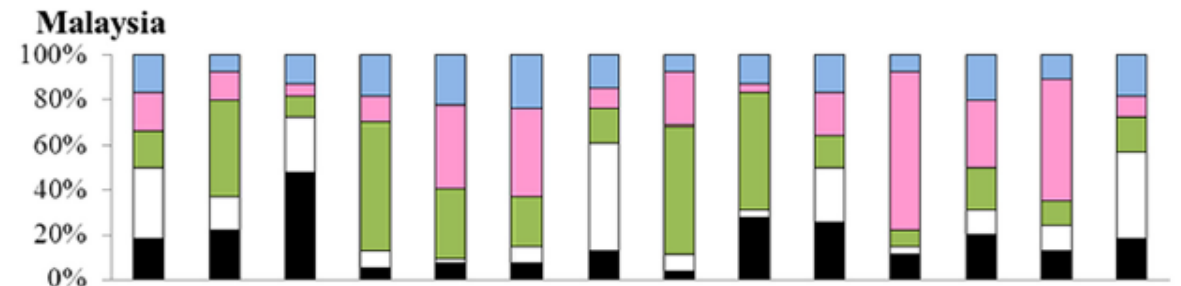
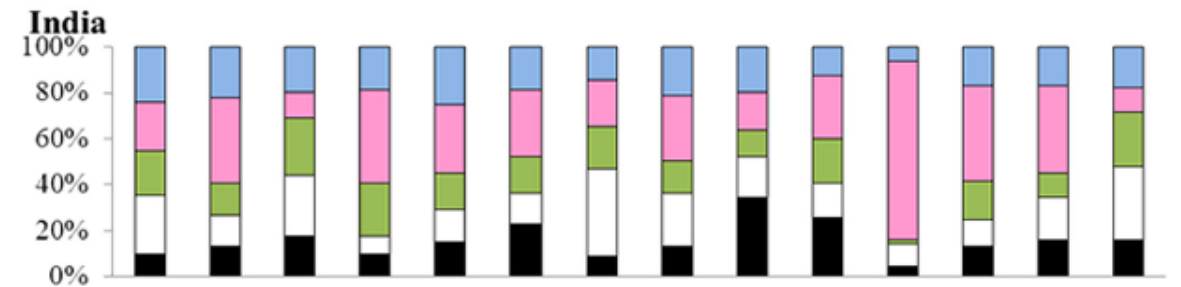
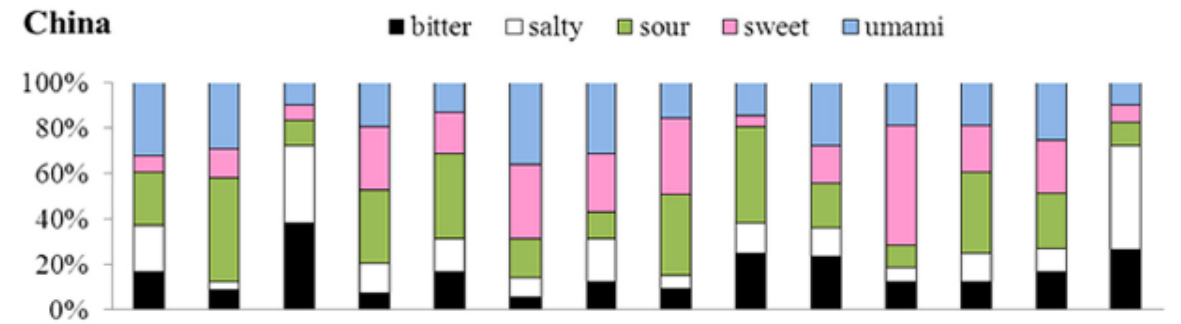




# CROSS-CULTURAL DISPARITIES:



**N=428 (Total)**

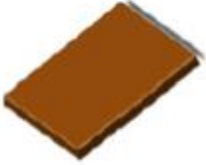



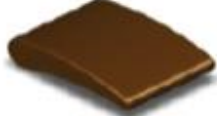

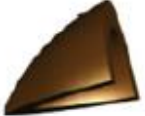





**Significant interaction between country and taste matching**

# IN REAL RESTAURANT



Same batch of chocolate mass was used to make these chocolates

Sample name	Sample picture	Sample name	Sample picture
Rectangle		Trapezoid	
Triangle		Round	
Wing		Ellipsoid	
Sail		Catstongue 1	
Oval		Catstongue 2	

The **Wing and Sail shapes** were the most delivering in high cocoa, caramel notes and aftertaste;

**Round and Rectangle** shapes were the highest ones in melting and smoothness.

# DIFFERENT SHAPE?

Different texture &  
flavor perception?



LWT - Food Science and Technology  
Volume 51, Issue 2, May 2013, Pages 545-552



Impact of the shape on sensory properties of  
individual dark chocolate pieces

Francine Lenfant , Christoph Hartmann, Brigitte Watzke, Olivier Breton, Chrystel Loret, Nathalie Martin 



# Food Shape







# PACKAGE

- LOGO
- COLOR
- FRONT-OF-PACKAGE (FOP)

• ...

## A

### Color matching various flavors



## B

### Flavor matching various colors



Country	Colour	Flavours	$\chi^2$	p
Colombia	Blue	<b>Natural (75.9%)</b>	149.93	<.001
	Orange	<b>Chicken (81%)</b>	173.31	<.001
	Fuchsia	Original (36.2%)	48.69	<.001
	Red	<b>Meat (55.2%), BBQ (36.2%)</b>	69.07	<.001
	Burgundy	<b>BBQ (89.7%)</b>	36.48	<.001
	Yellow	Original (48.3%)	66.07	<.001
	Green	<b>Lemon (91.4%)</b>	39.72	<.001
China	Blue	Cheese and bacon (24.1%)	13.93	.030
	Orange	Lemon (29.3%)	24.07	.001
	Fuchsia	Chicken (24.1%)	15.62	.016
	Red	BBQ (50%)	54.55	<.001
	Burgundy	BBQ (34.5%)	22.69	<.001
	Yellow	<b>Lemon (51.7%)</b>	70.17	<.001
	Green	<b>Cucumber (70.7%)</b>	126.55	<.001
UK	Blue	<b>Cheese and onion (72.4%)</b>	101.48	<.001
	Orange	<b>Chicken (60.3%)</b>	105.41	<.001
	Fuchsia	<b>Meat (41.4%), BBQ (29.3%)</b>	58.35	<.001
	Red	<b>Meat (62.1%)</b>	68.55	<.001
	Burgundy	<b>BBQ (65.5%)</b>	78.38	<.001
	Yellow	<b>Lemon (77.6%)</b>	87.79	<.001
	Green	<b>Cucumber (75.9%)</b>	114.57	<.001

- Flavors in bold: significant correspondence with the color
- Similarities and dissimilarities both existed.





# FRONT-OF-PACKAGE (FOP)





1971



1987



1992



2011–Present

## THE STARBUCKS LOGO OVER TIME

## THE PEPSI LOGO OVER TIME

PEPSI 1898:



PEPSI 1905:



PEPSI 1974:



PEPSI 1987:



PEPSI 1906:



PEPSI 1940:



PEPSI 1991:



PEPSI 1998:



PEPSI 1950:



PEPSI 1962:



PEPSI 2003:



PEPSI 2006:



PEPSI 2009:



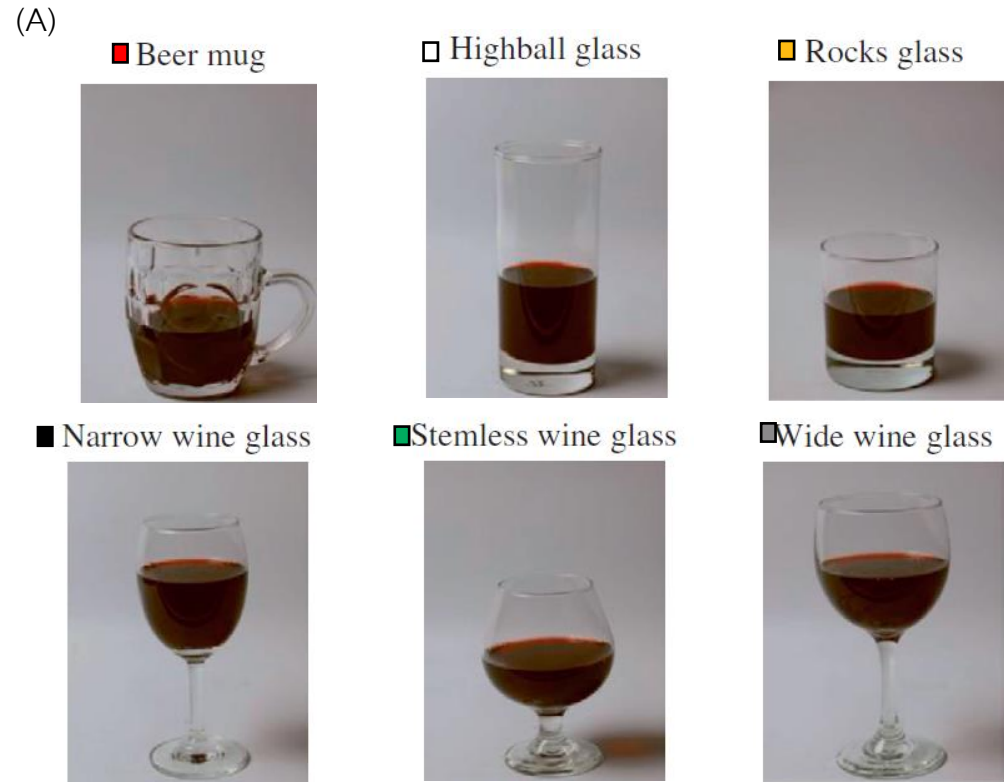


# PRESENTATION

- Cutlery
- Background light
- ...

**Color of the plates** have significant influences while shape does not have: dessert on the white plate tasted sweeter and more flavorful than on the black one





(A) Six glasses (with red wine inside) used.

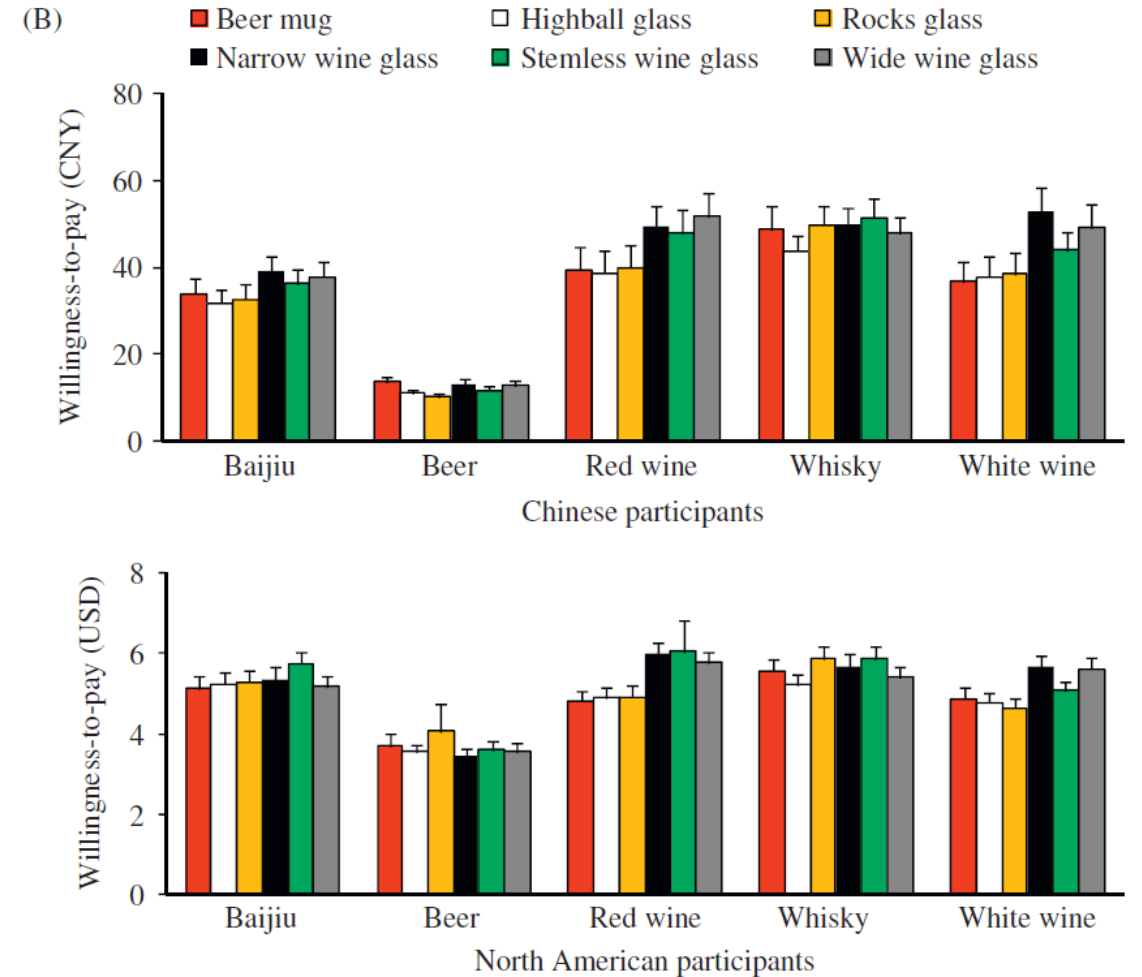


Food Quality and Preference  
Volume 39, January 2015, Pages 109-116



When the shape of the glass influences the flavour associated with a coloured beverage: Evidence from consumers in three countries

Xiaoang Wan <sup>a, b, c, d, e</sup>, Andy T. Woods <sup>c</sup>, Kyoung-Hwan Seoul <sup>a</sup>, Natalie Butcher <sup>d</sup>, Charles Spence <sup>b</sup>





# Franco-Colombian chef Charles Michel

(A) Plating inspired by Kandinsky's  
"Painting number 201," hanging  
(the other way up) in the MoMA in  
New York



(B) Same ingredients now served  
as a regular tossed salad.

(C) The ingredients laid out side  
by side—an effortful presentation,  
but not an especially aesthetically  
pleasing one.