

# Quantifying Perceived Chroma Changes of Illuminated Objects due to the Hunt Effect

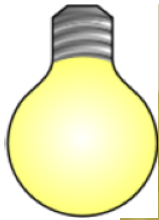
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## ***Hunt Effect***

The illuminance level of the lighting can affect to the perceived saturation

Low light level

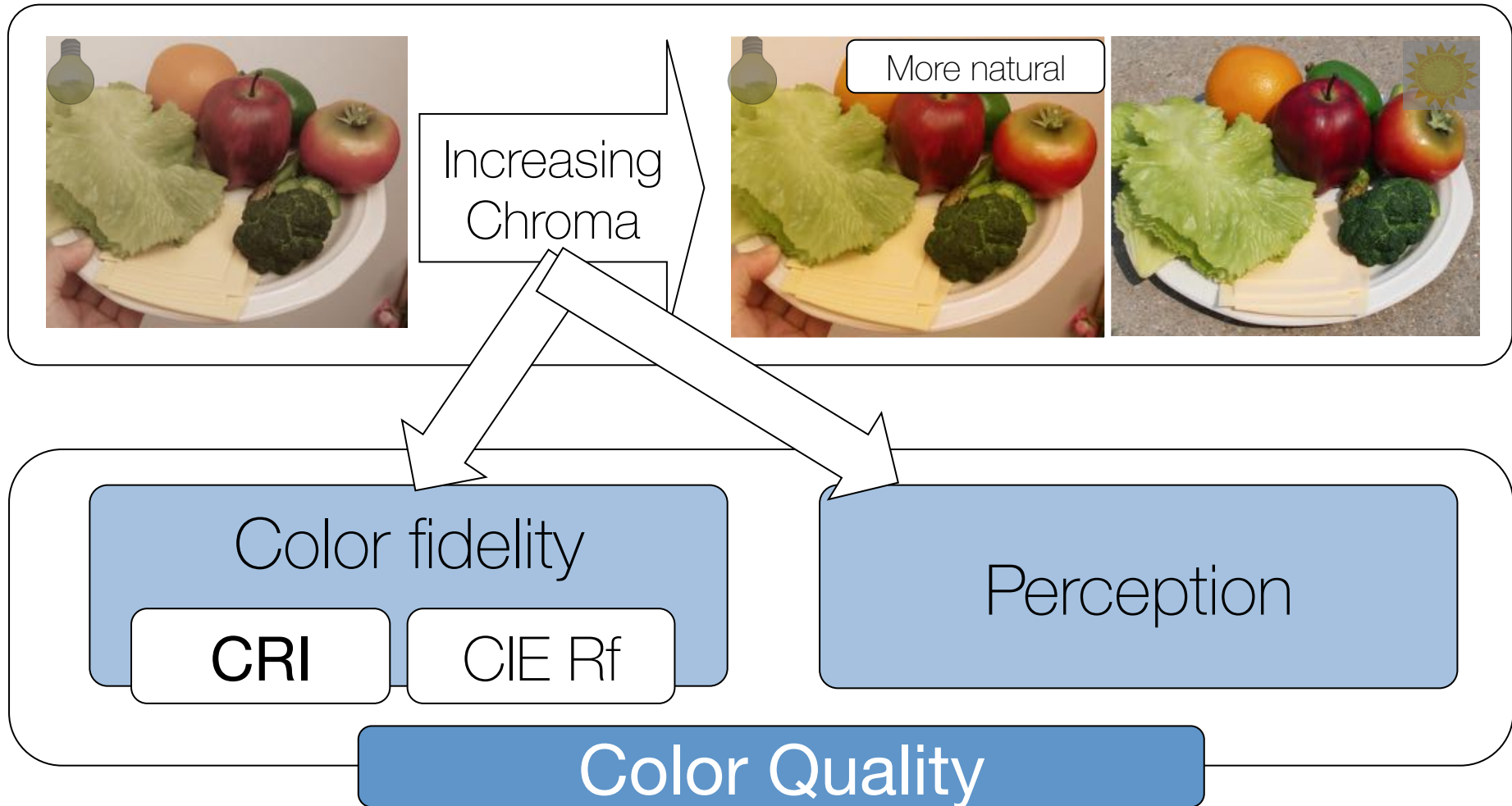


High light level



# Introduction - Hunt Effect on Color Quality

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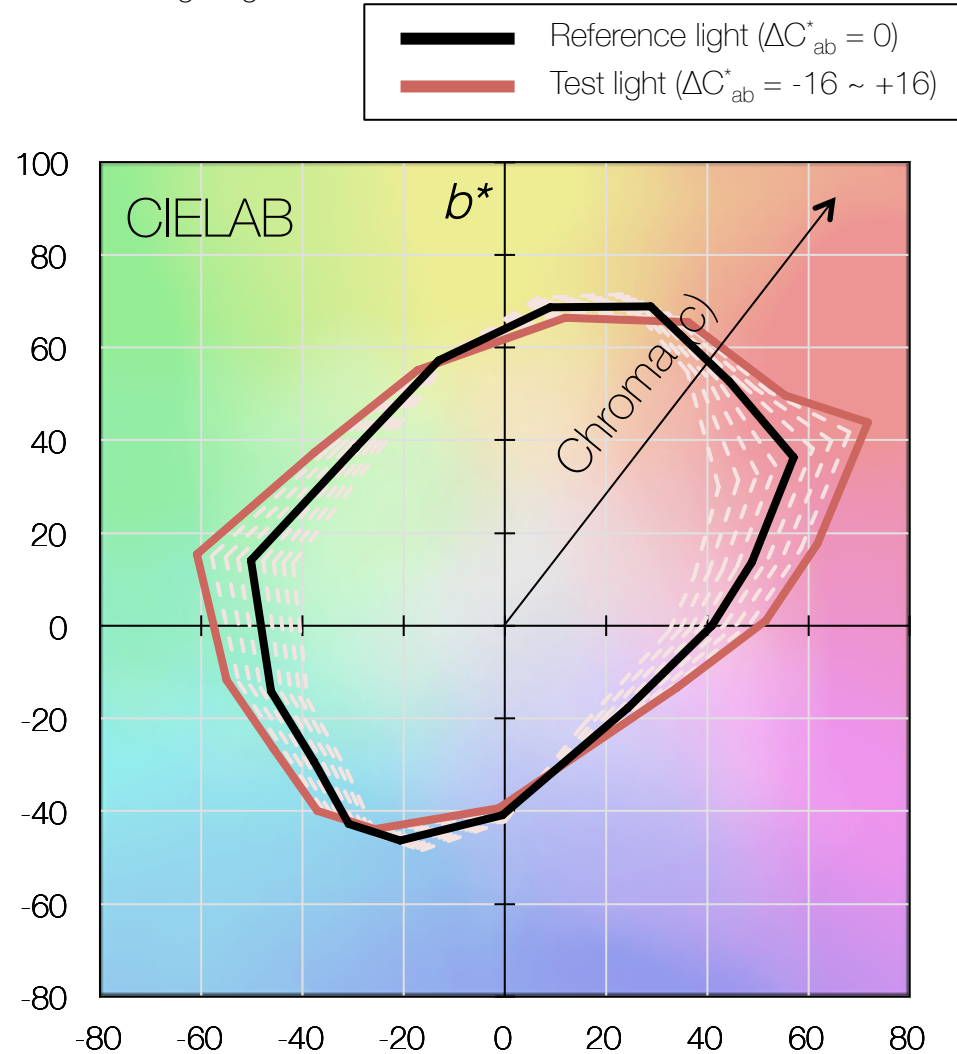
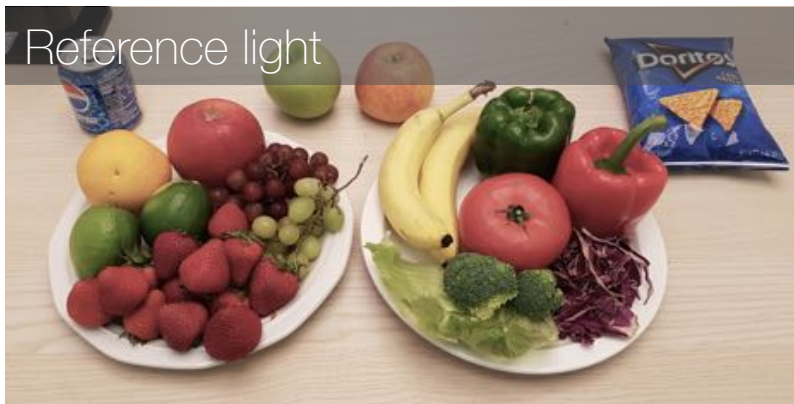
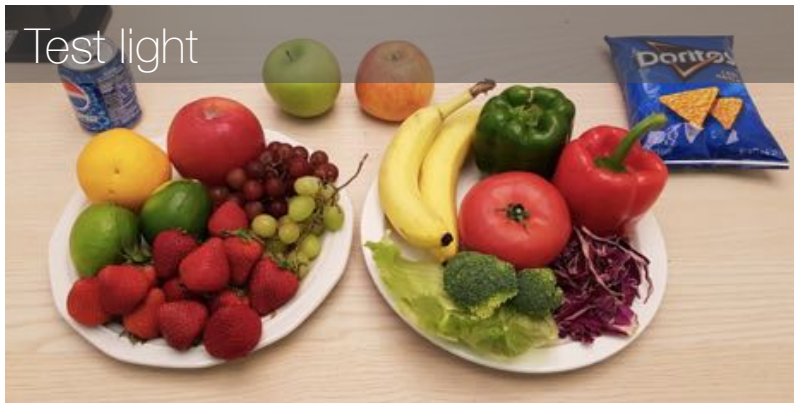
- However, there are only a few studies about Hunt Effect using light levels for general lighting

# Introduction - Previous (2017) experiment

Kawashima & Ohno (2017), "Vision Experiment on Verification of Hunt Effect for Lighting",  
CIE-USNC and CNC/CIE Joint Annual Meeting

## Research Question

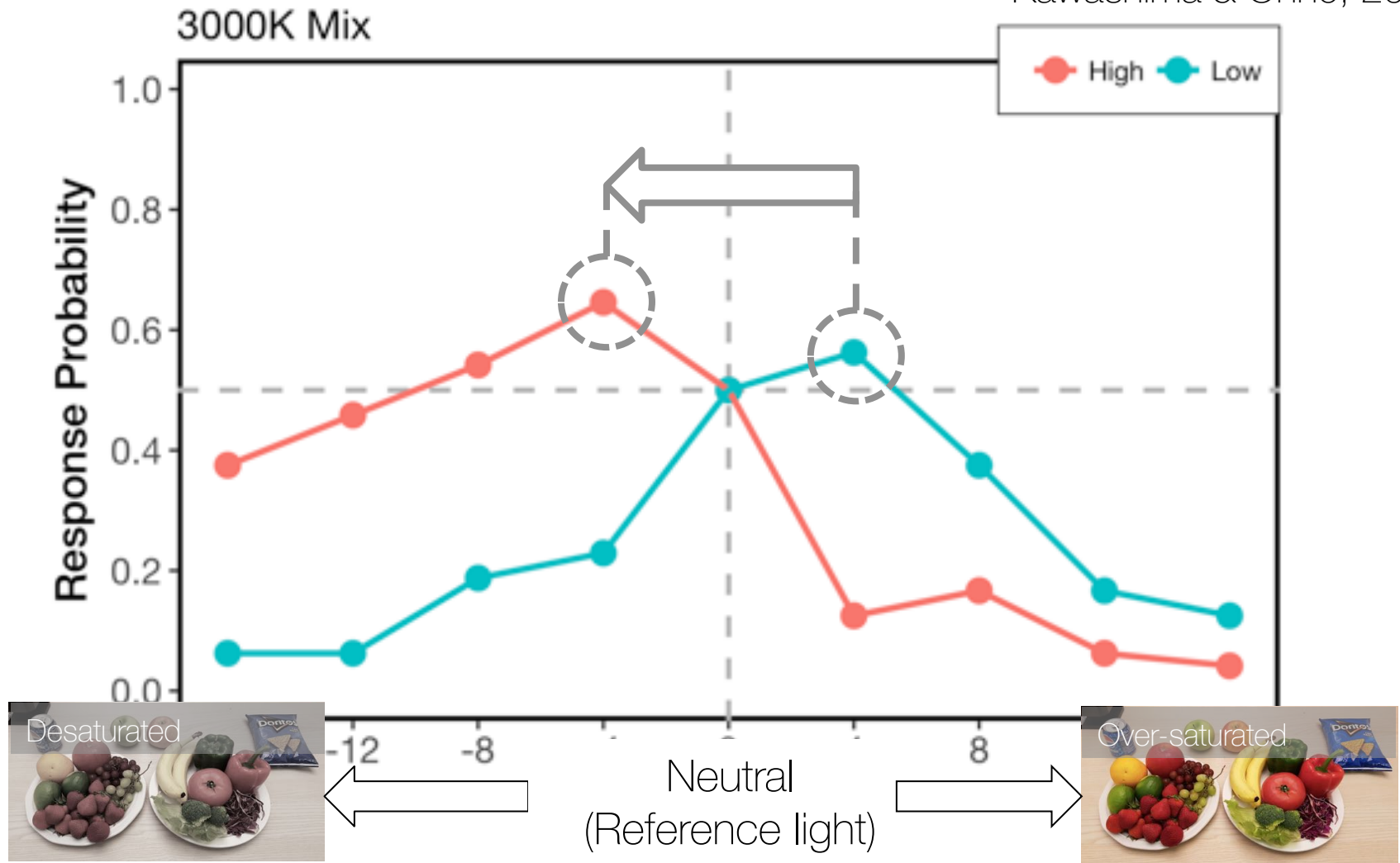
Whether is the *Hunt Effect* effective  
at normal indoor lighting?



# Introduction - Previous (2017) experiment

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Kawashima & Ohno, 2017

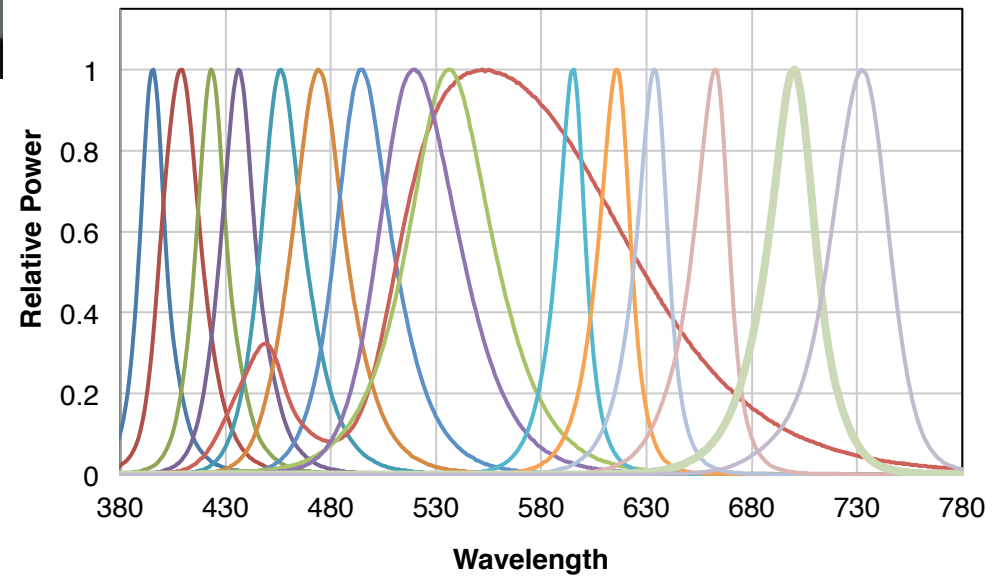
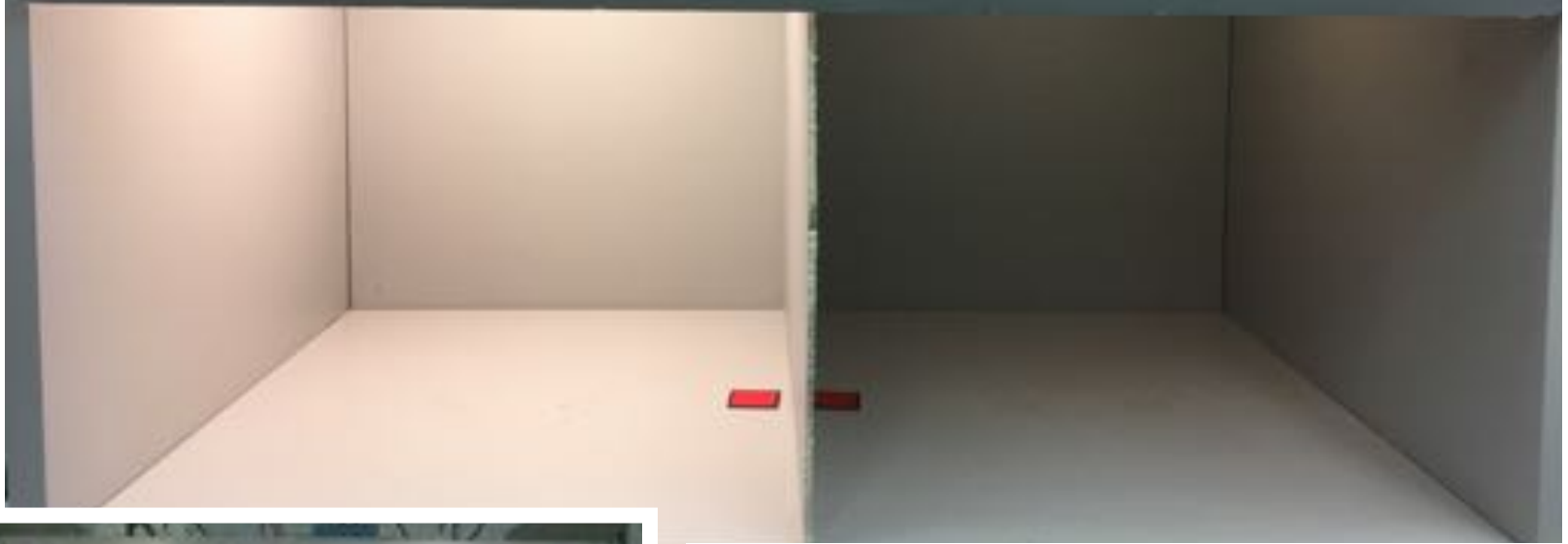


- The Hunt Effect is effective at normal indoor lighting levels, which was tested at 100 lx and 1000 lx

How much chroma saturation would be changed by the Hunt Effect?

Saturation-matching Experiment

## Spectrally-Tunable (ST) Double Booth



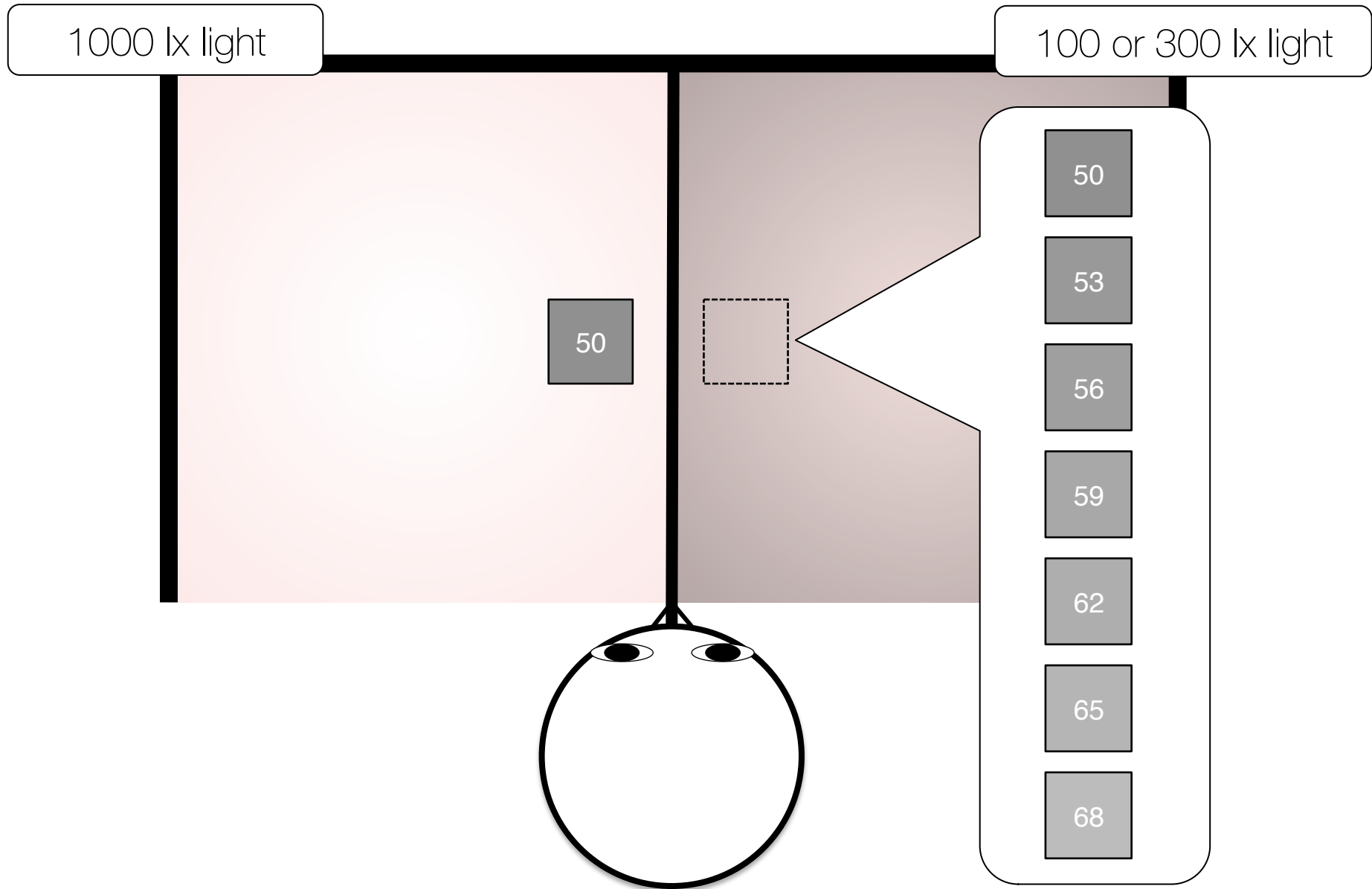




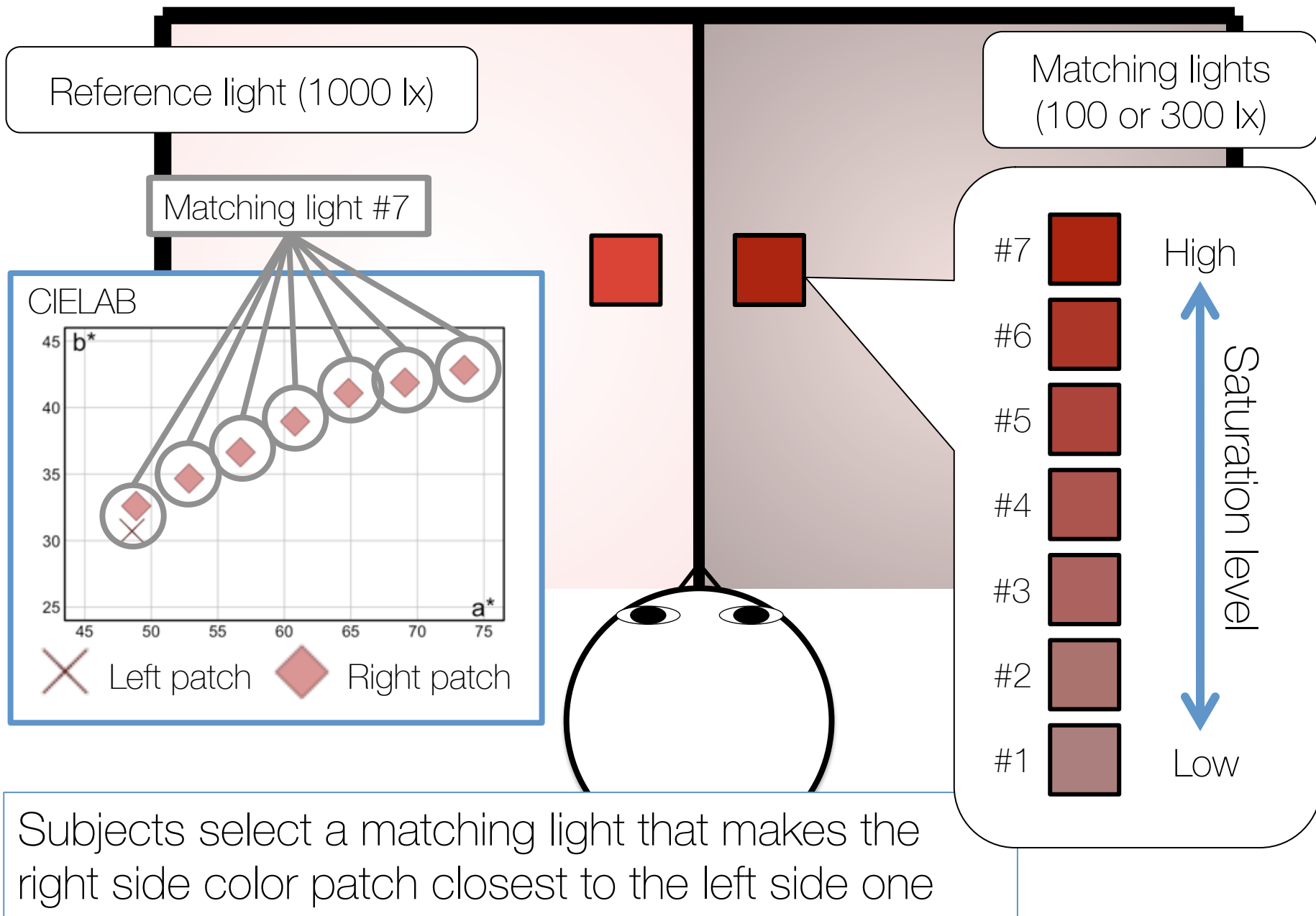


# Method - Gray scale matching

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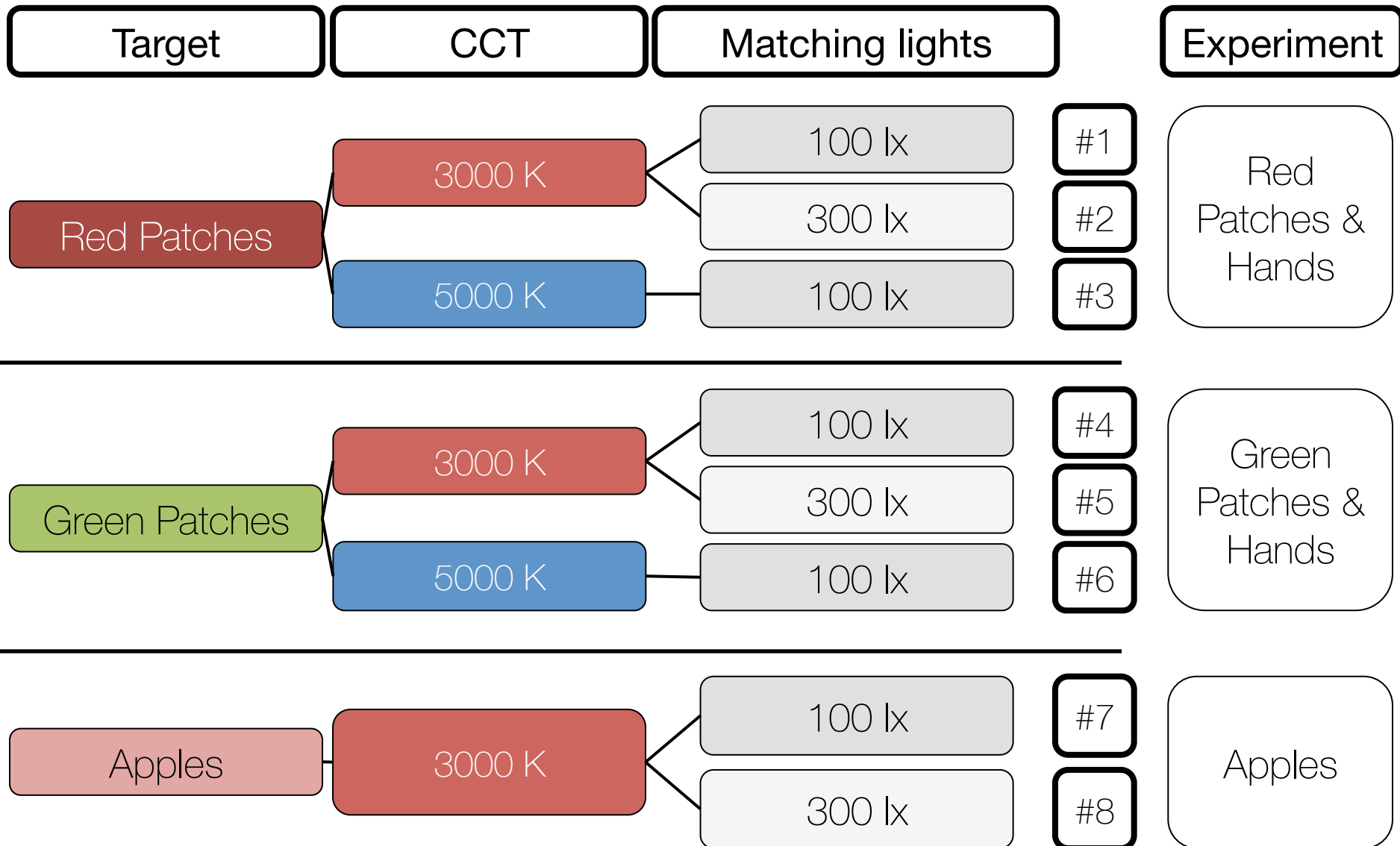


# Method - Experimental setting



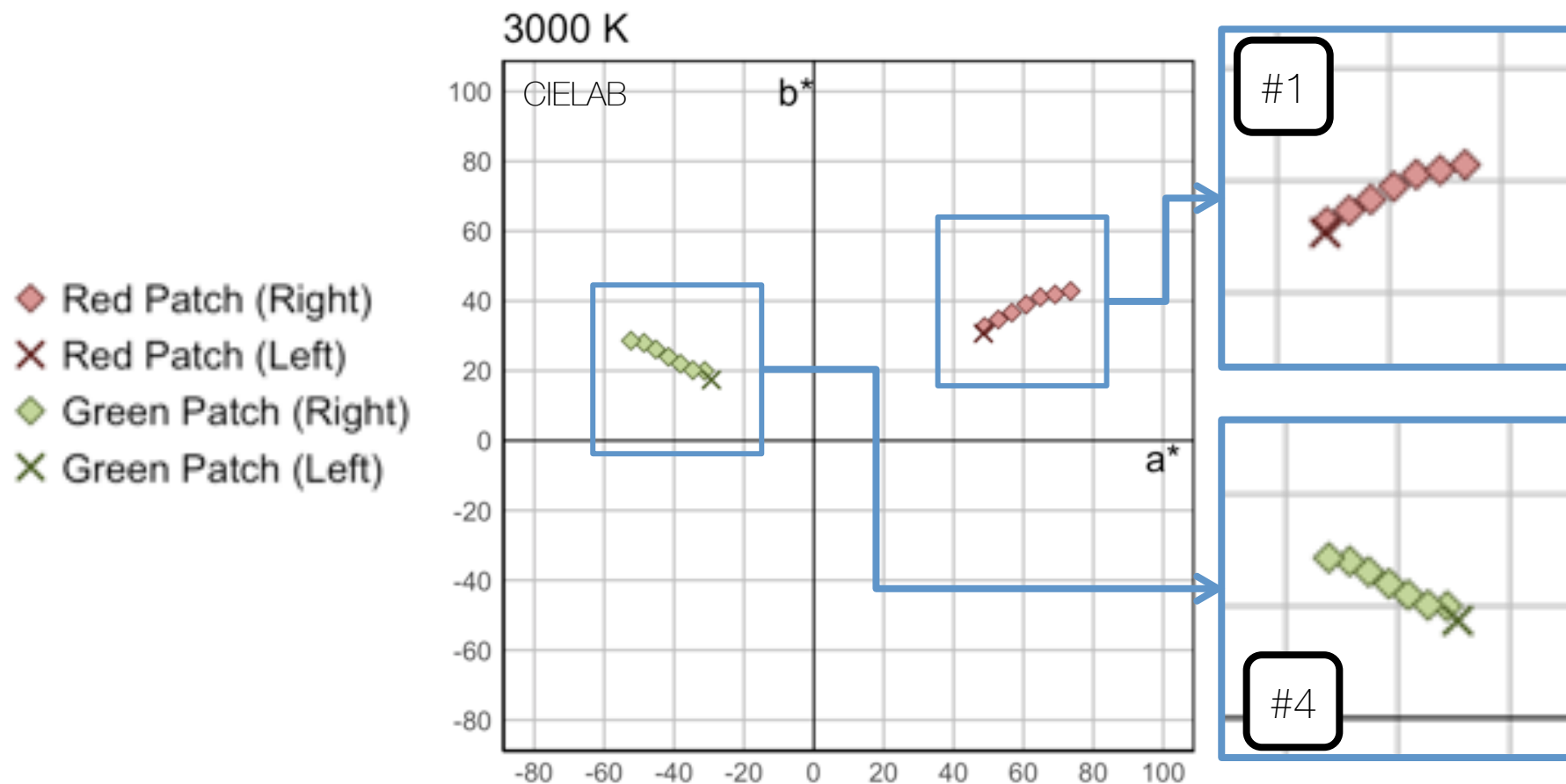
# Method - Light sets & Targets

- 8 light sets (1 light set = 1 reference + 6 or 7 matching lights)



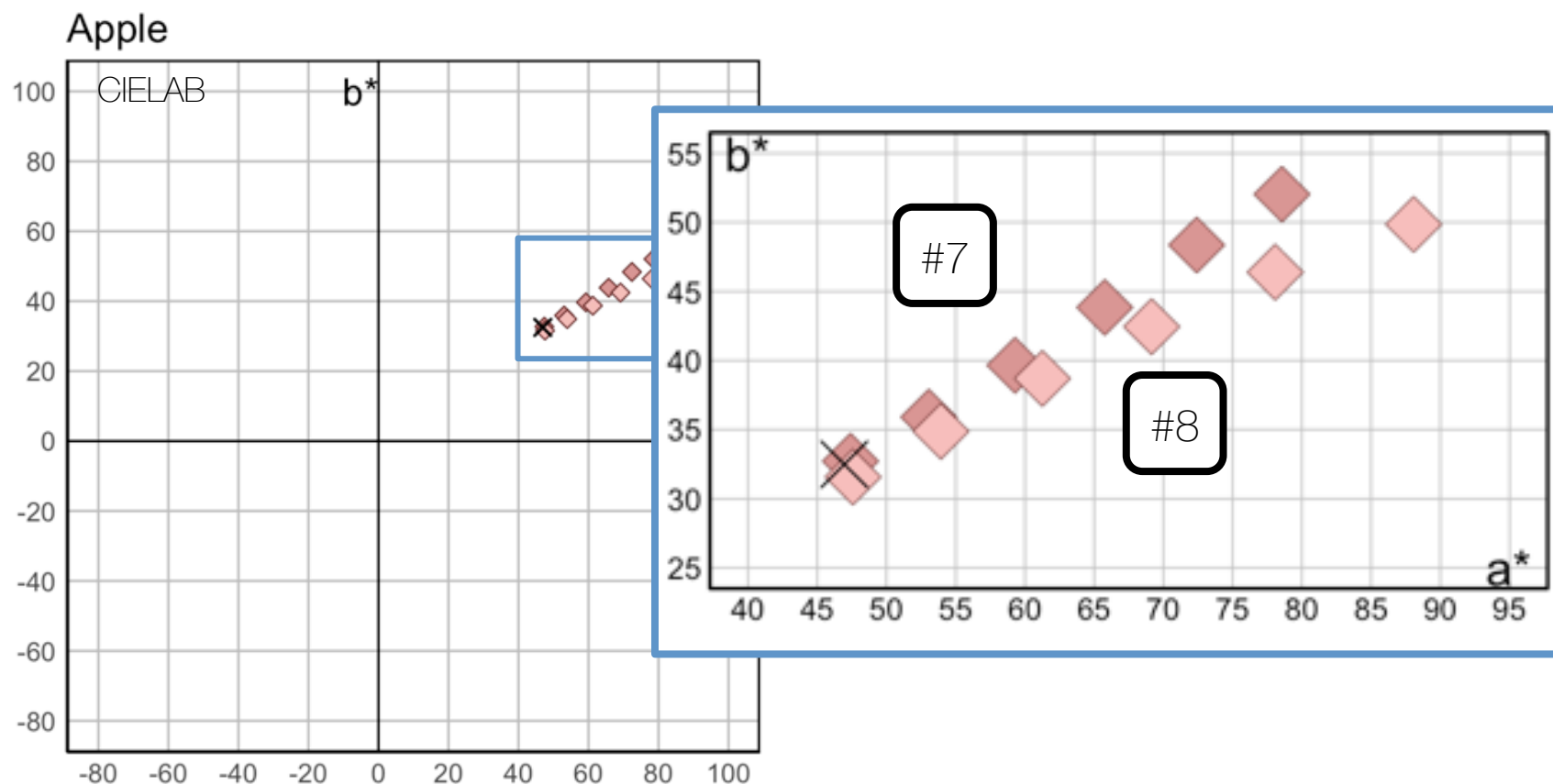
# Method - Light sets (3000 K)

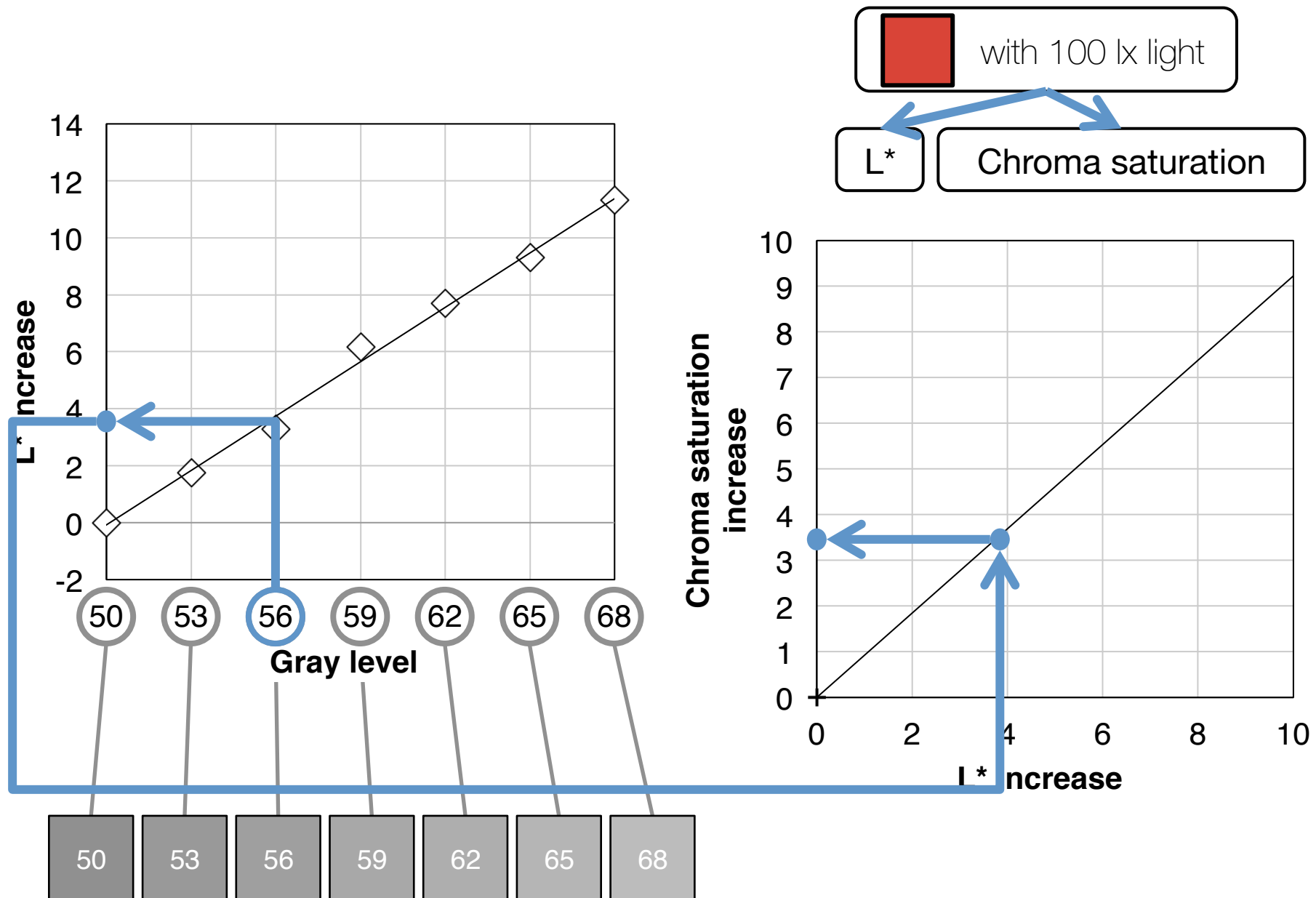
	Target	CCT	Matching lights
#1	Red Patches	3000 K	100 lx
#4	Green Patches	3000 K	100 lx



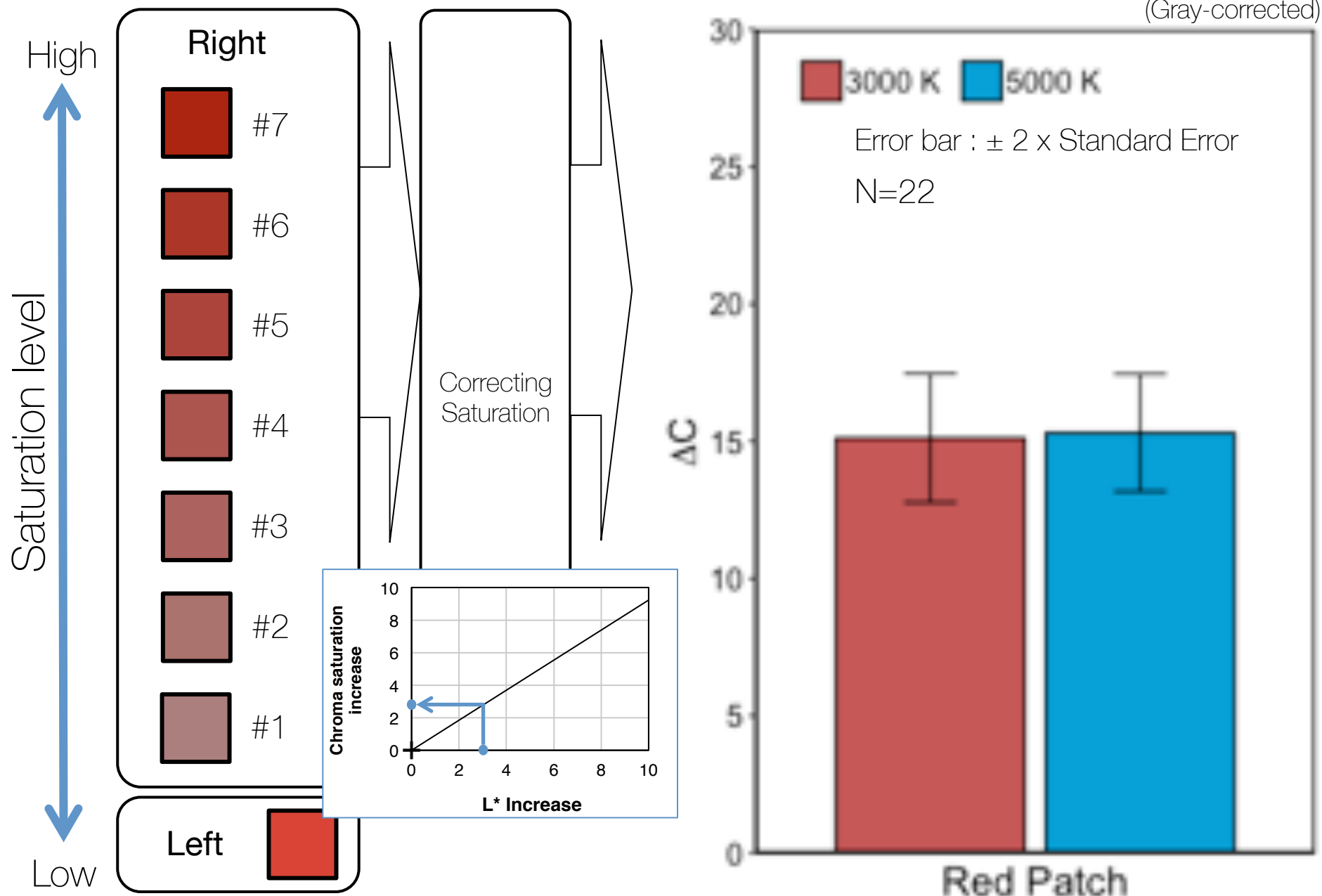
# Method - Light sets (for Apple)

	Target	CCT	Matching lights
#7	Apples	3000 K	100 lx
#8	Apples		300 lx





# Analysis - Saturation correction

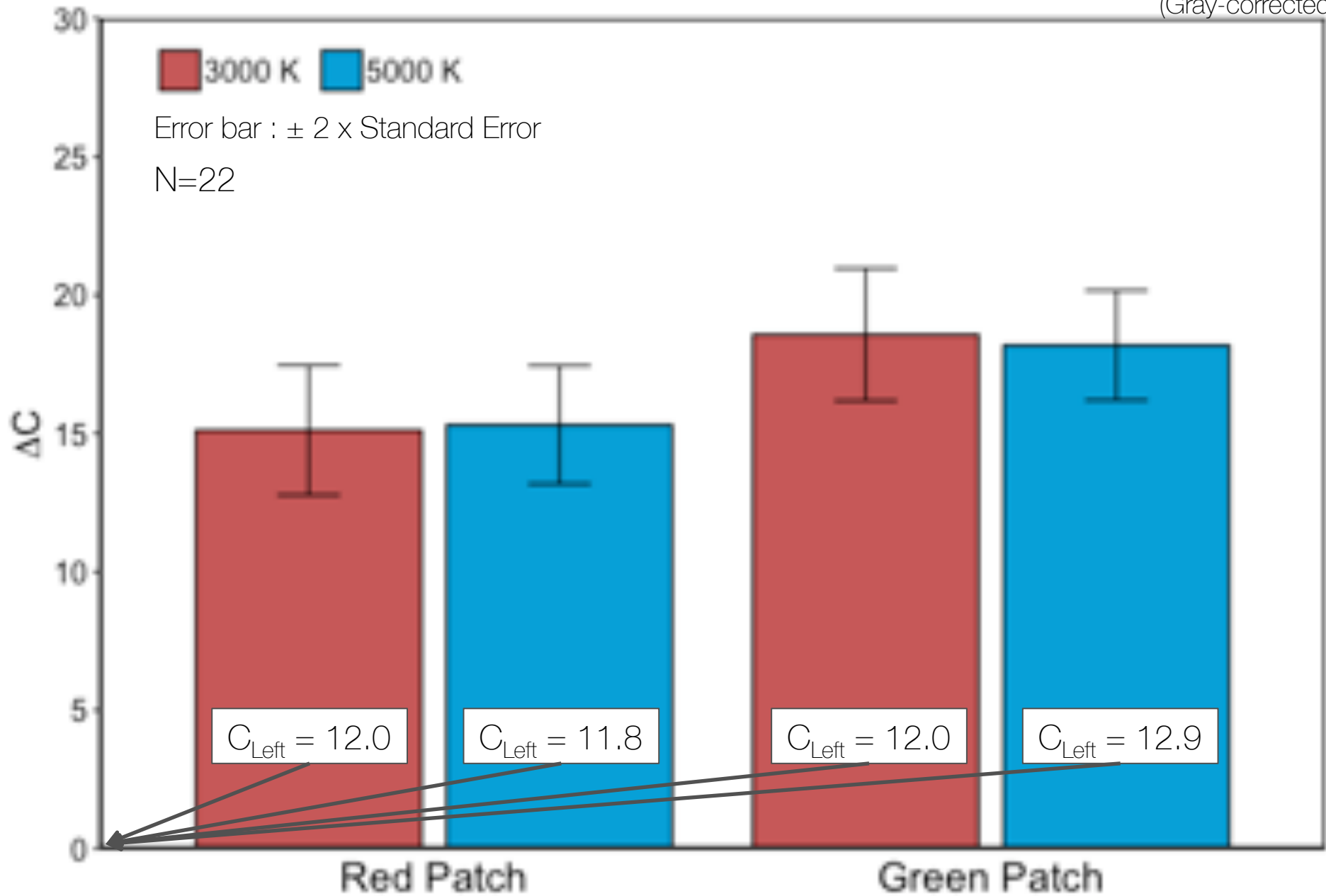




# Result - Red & Green Patches at 100 lx

16

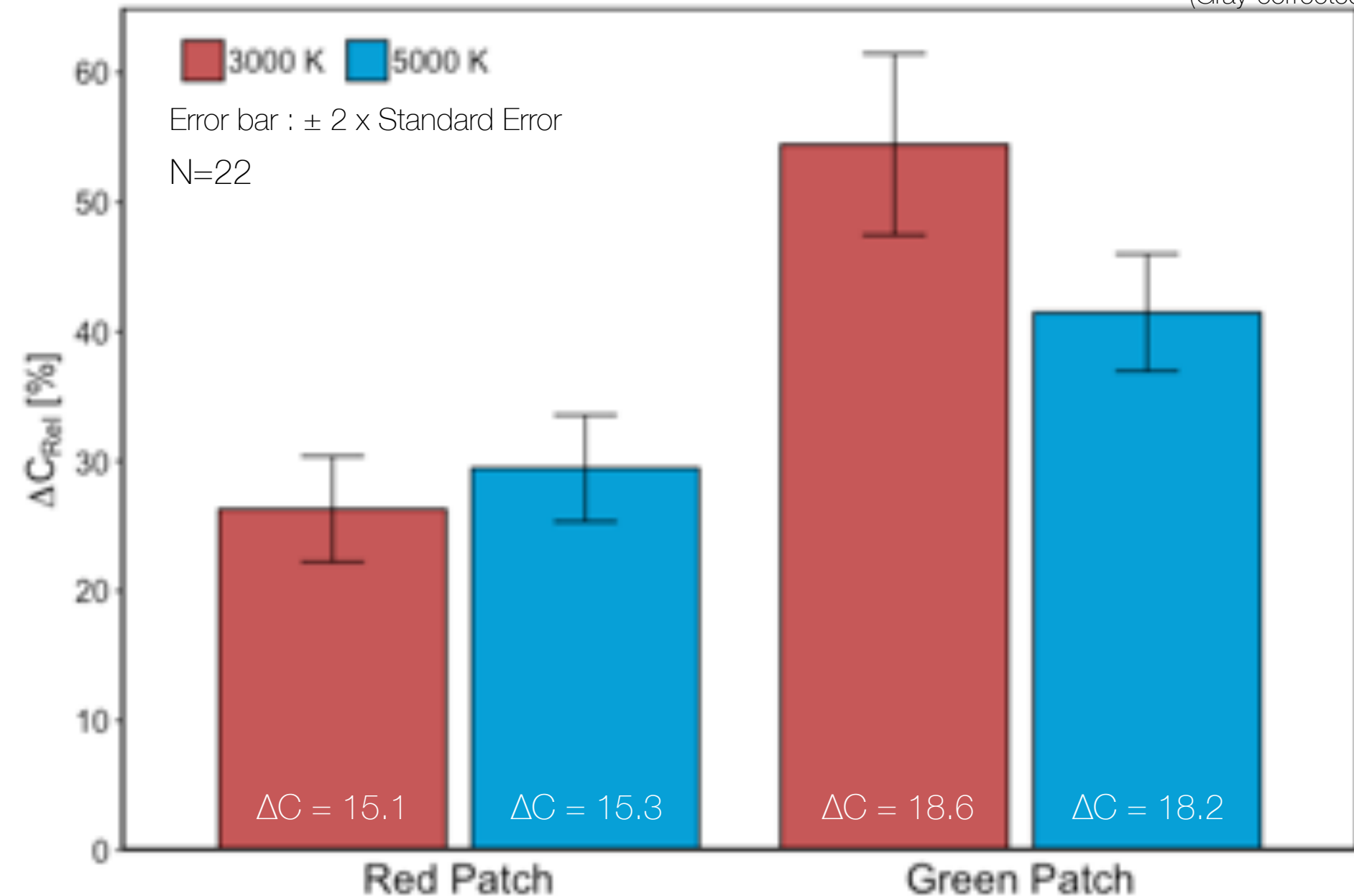
(Gray-corrected)



# Results - Red & Green Patches at 100 lx (Rel)

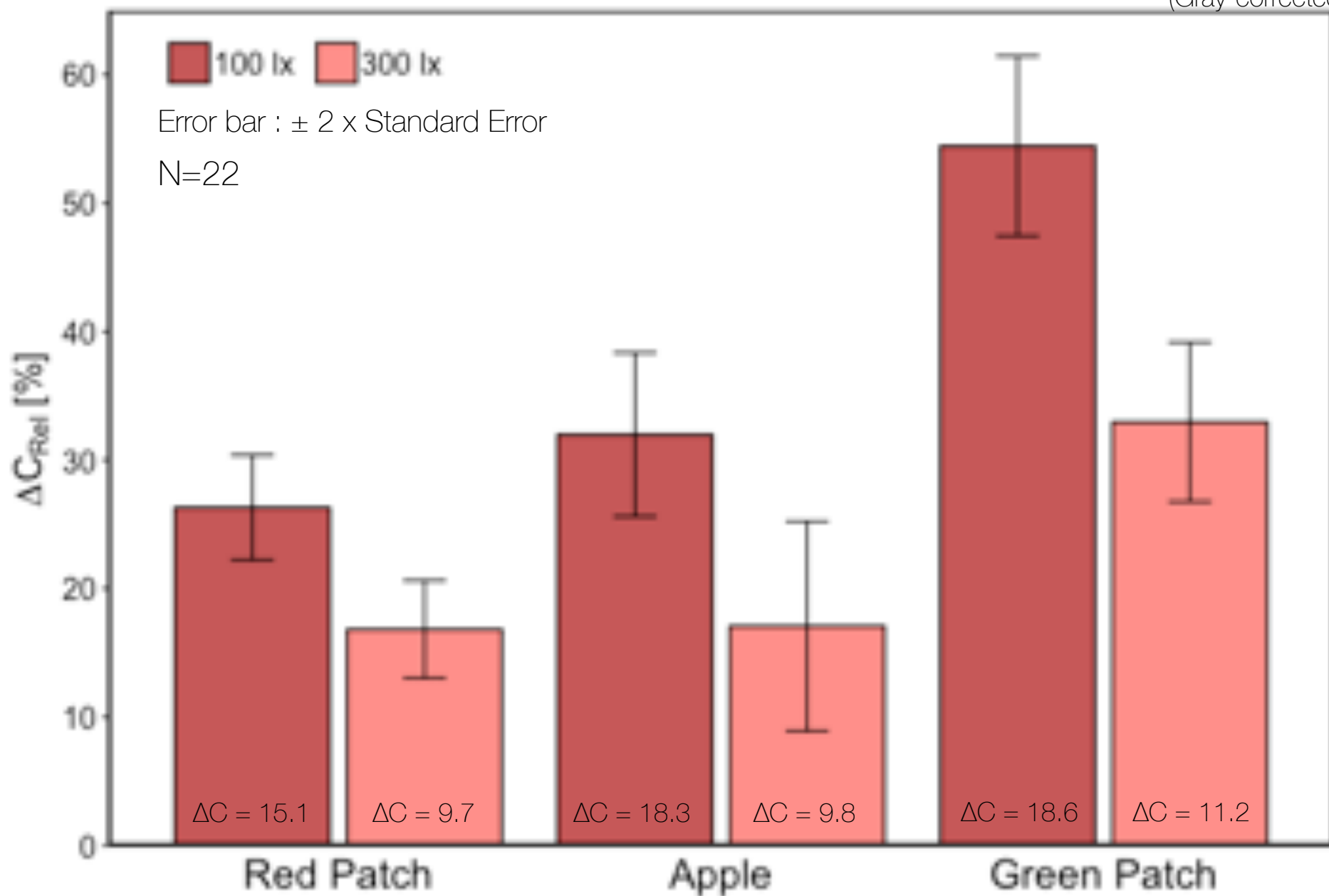
17

(Gray-corrected)



# Results - 100 lx vs. 300 lx (at 3000 K)

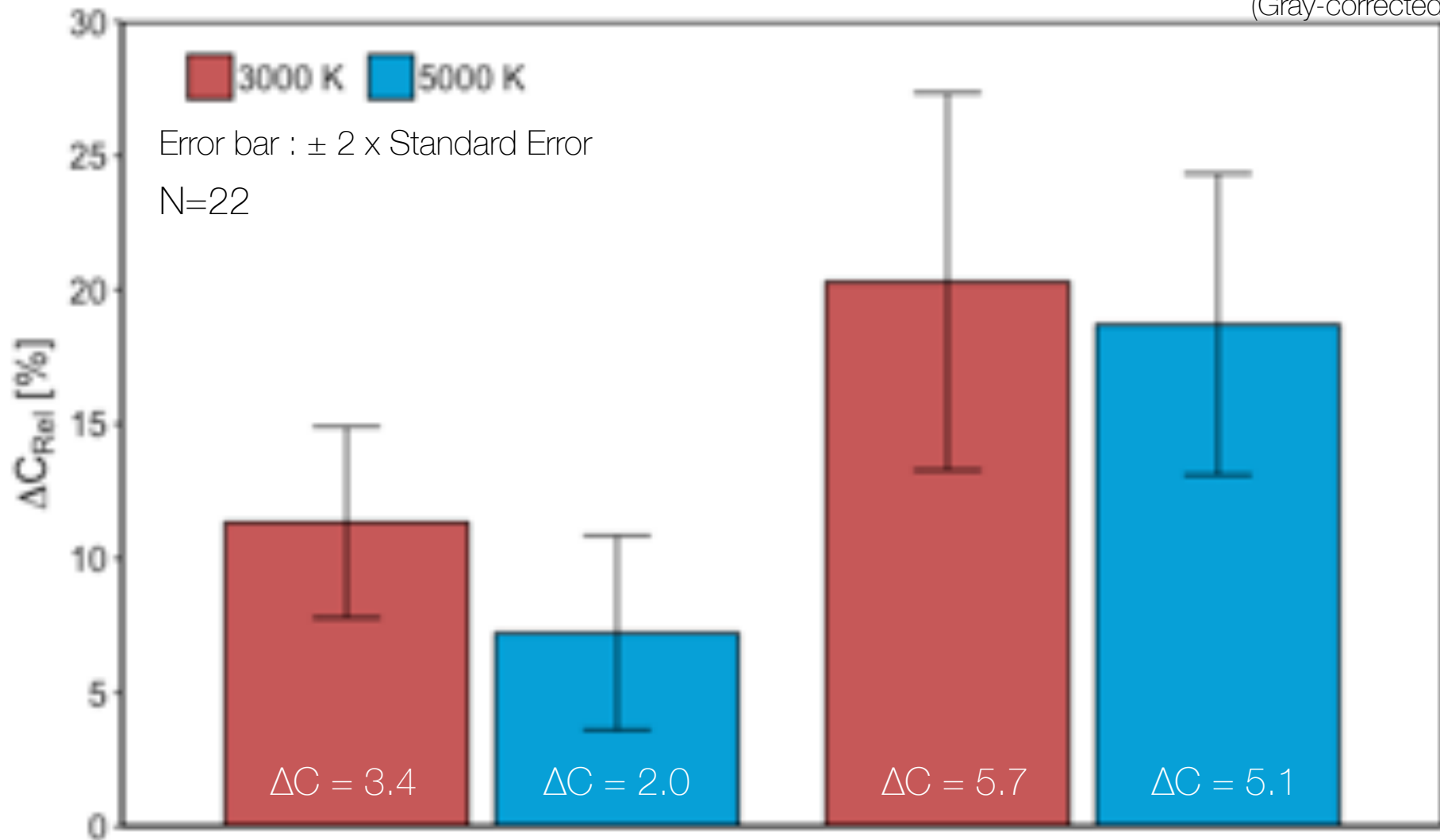
(Gray-corrected)



# Results - Hand at 100lx

19

(Gray-corrected)



Light Set #

#1

#3

#4

#6

Target

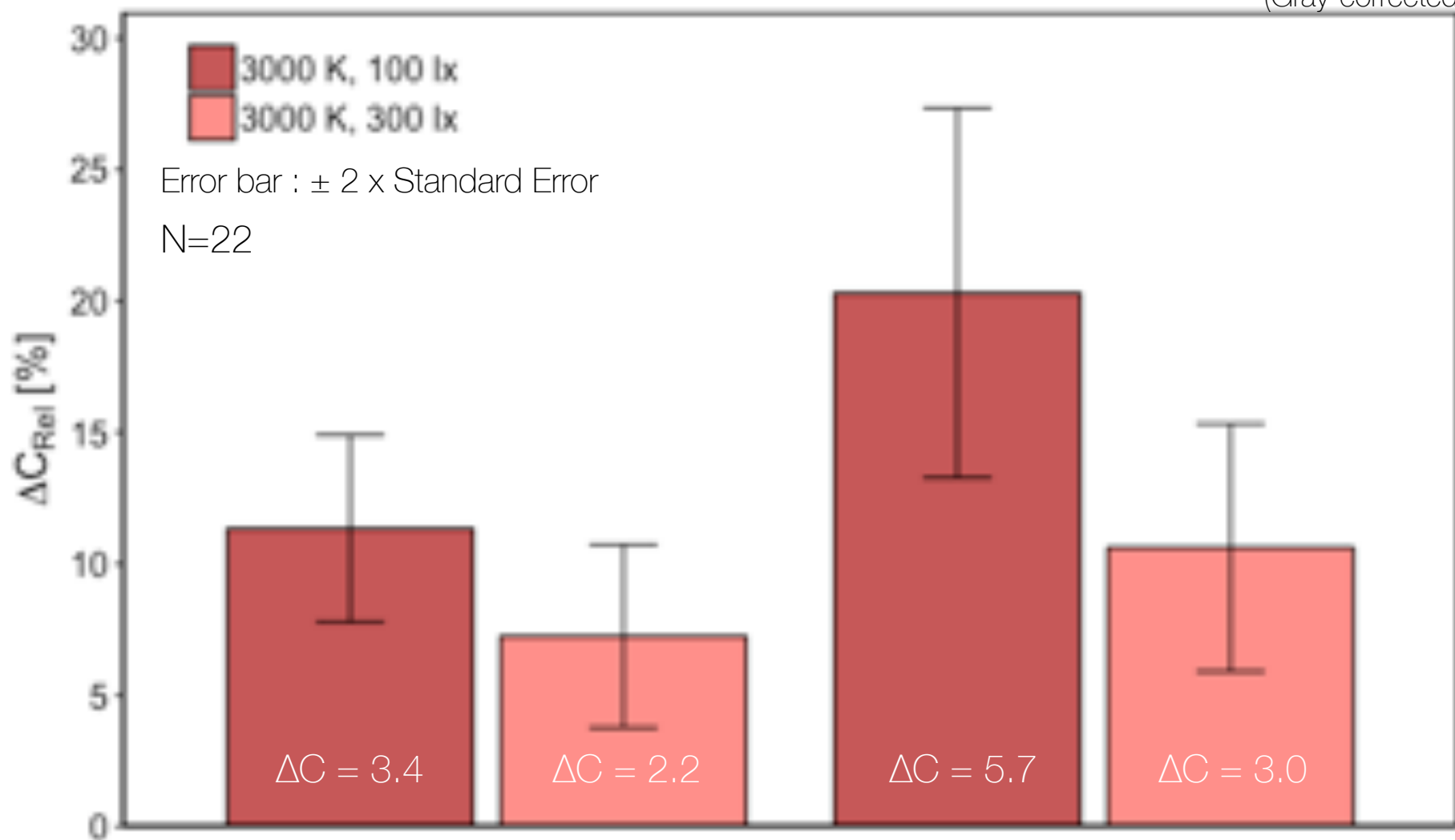
Red Patches

Green Patches

# Results – 100 lx vs. 300 lx (Hand, at 3000 K)

20

(Gray-corrected)



Light Set #

#1

#2

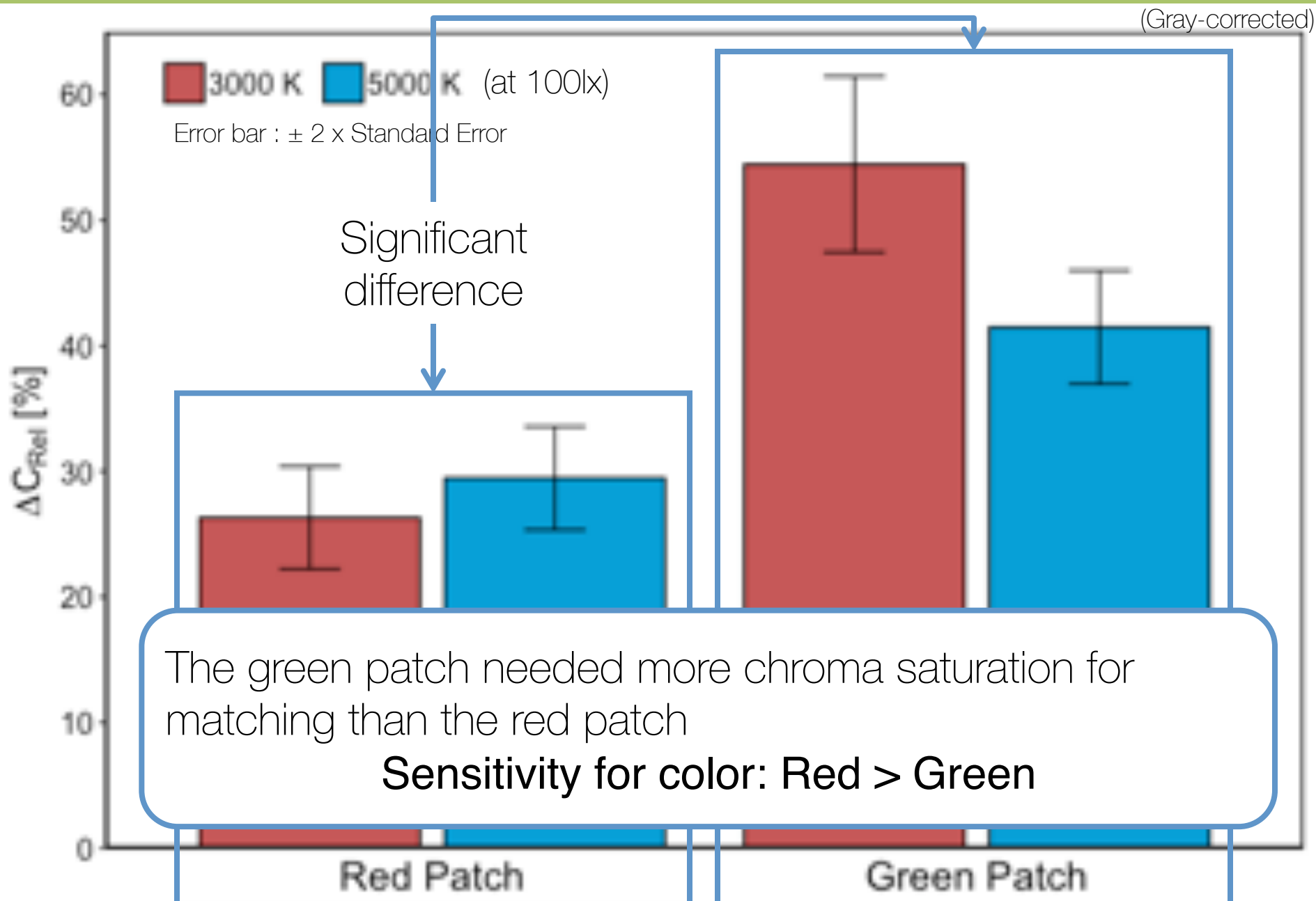
#4

#5

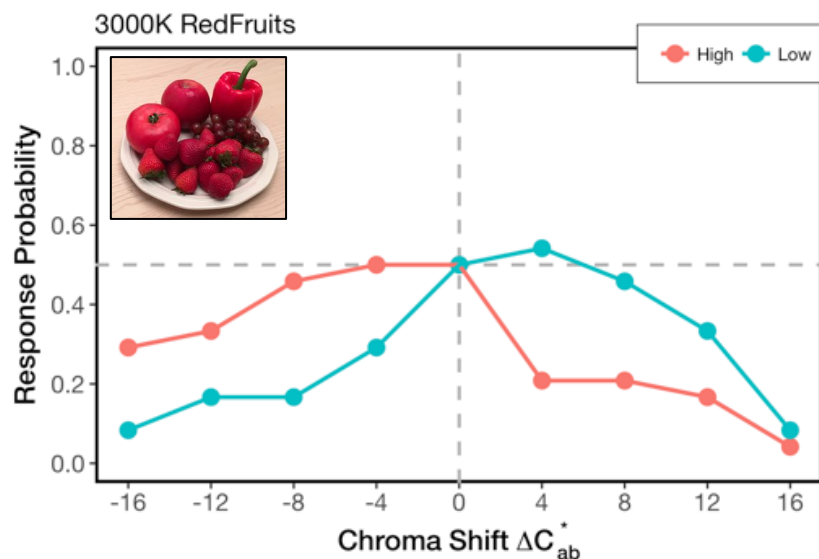
Target

Red Patches

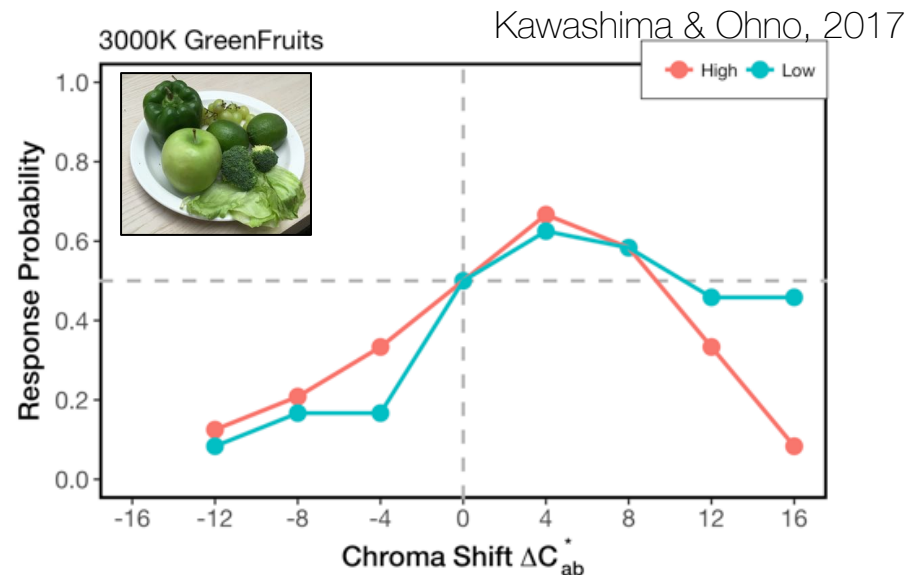
Green Patches



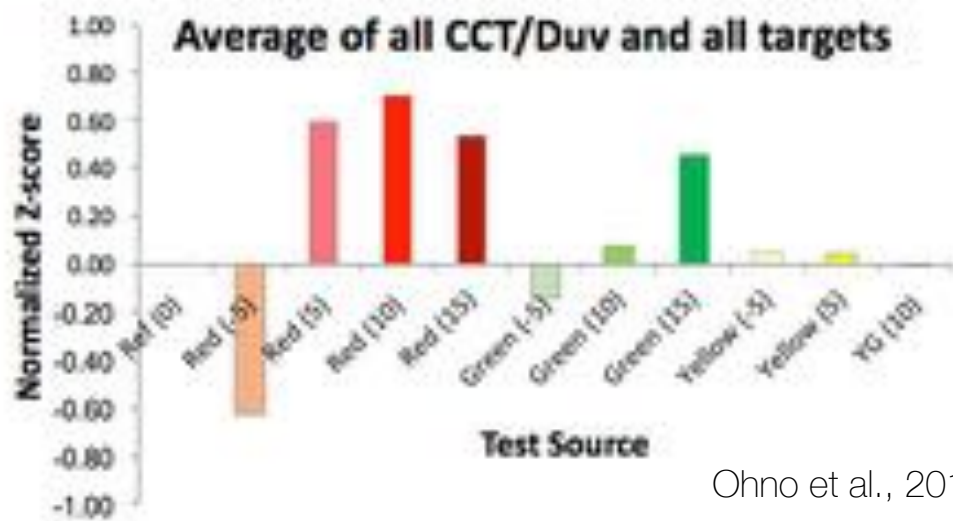
# Discussion



- Changes of the objects' appearance was easily detected

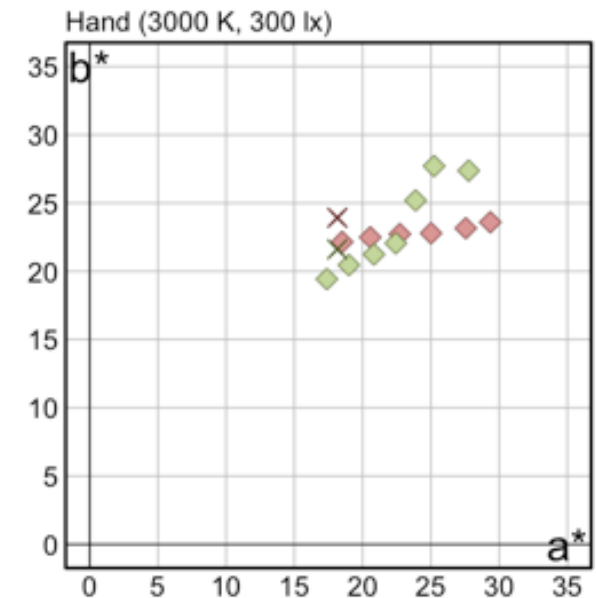
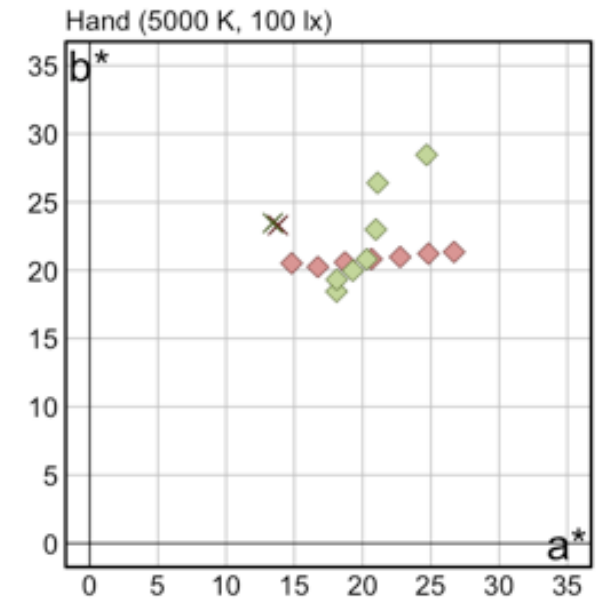
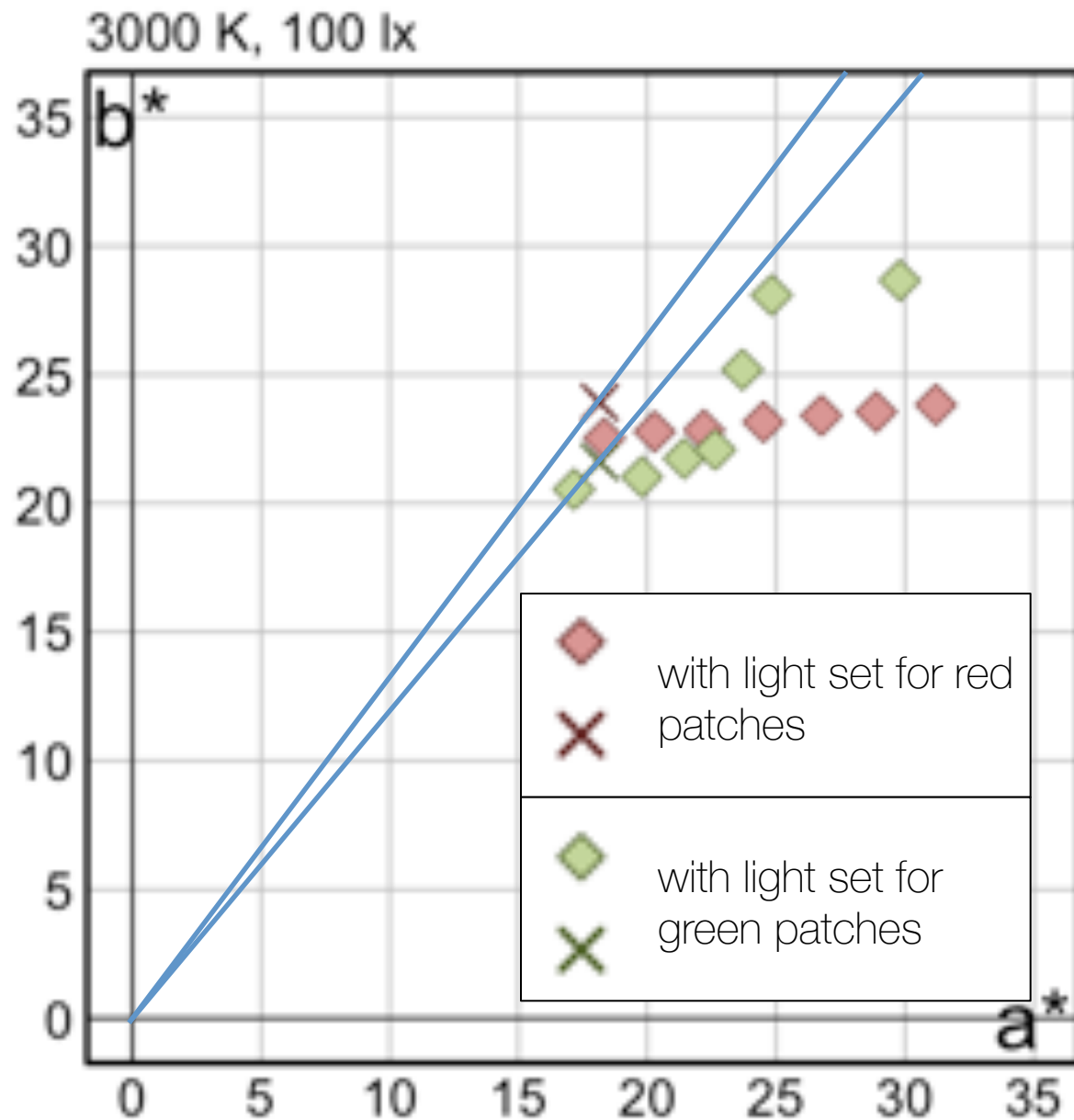


- Changes of the objects' appearance was hardly detected



- Chroma changes of red has the largest effect on the preference for illuminated objects
- Green was 2nd





- The experimental results showed
  - at 100 lx level, the red sample chroma decreased by 30%, the green sample chroma decreased by 40~50% compared to those at 1000 lx
- Further research needed for different hue objects at more different illuminance levels

Thank you for your attention

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