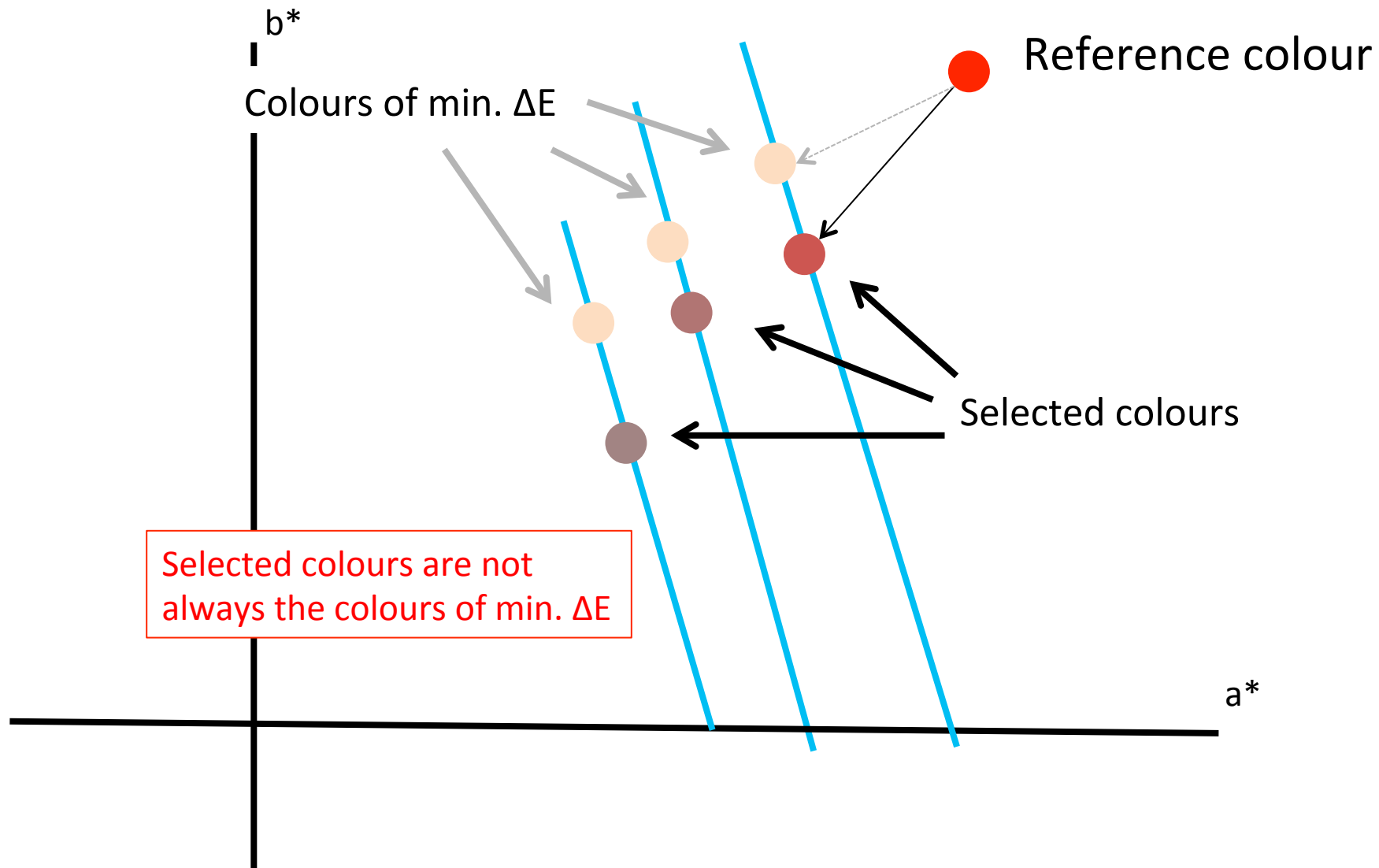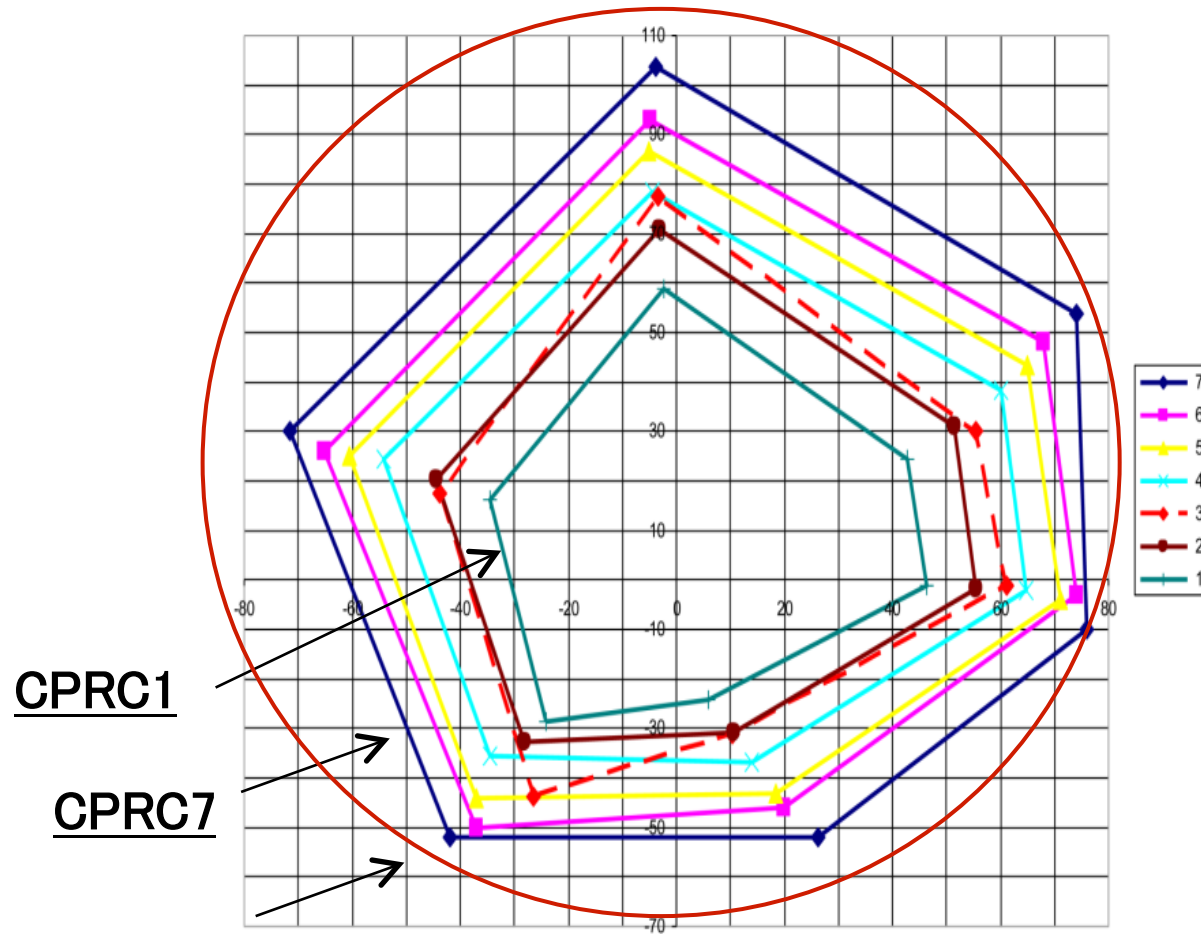# A metric to evaluate the closeness of the two colours

Yasuki Yamauchi

Yamagata University
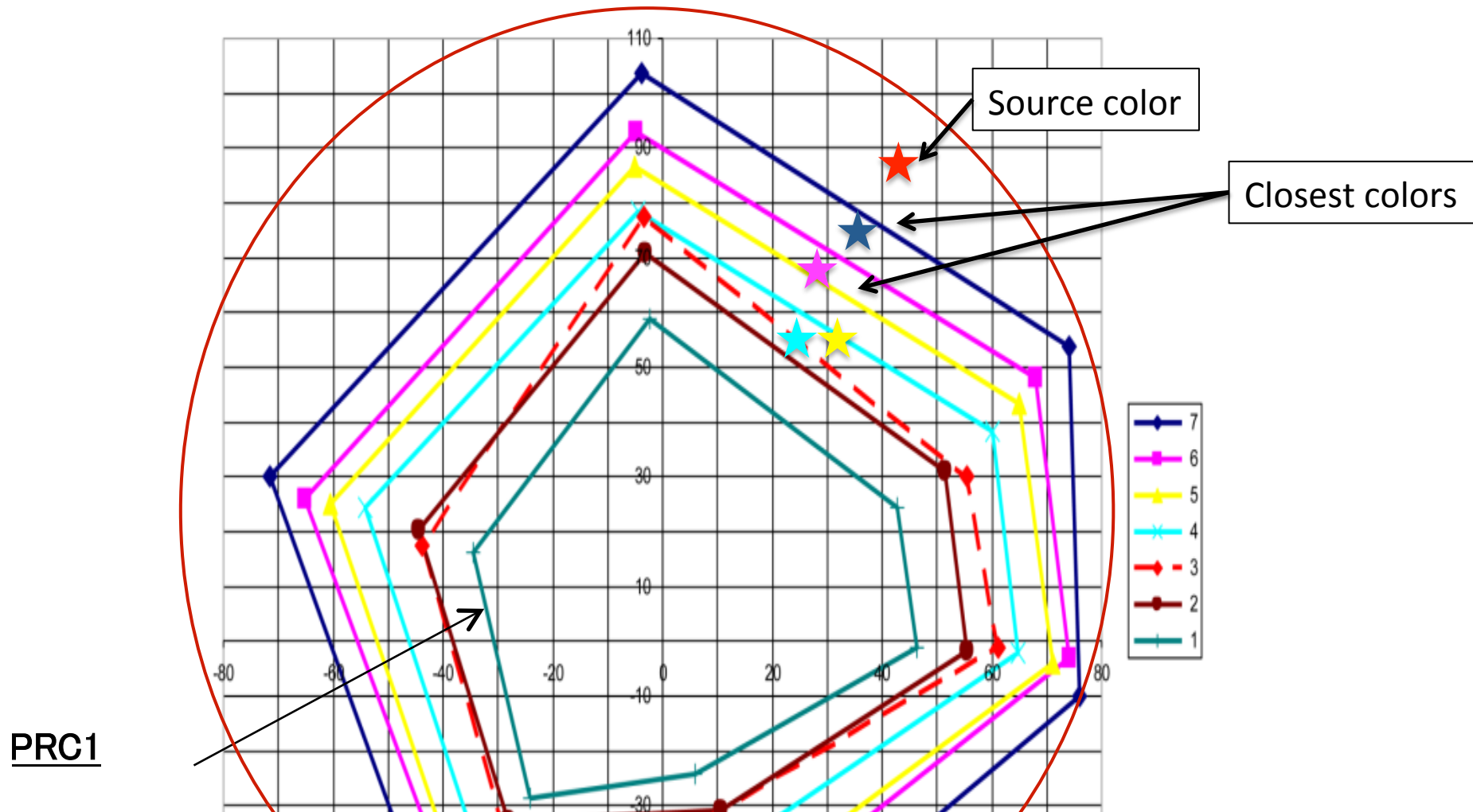
Task: "Find the closest colour on a line (e.g. equal saturation)"
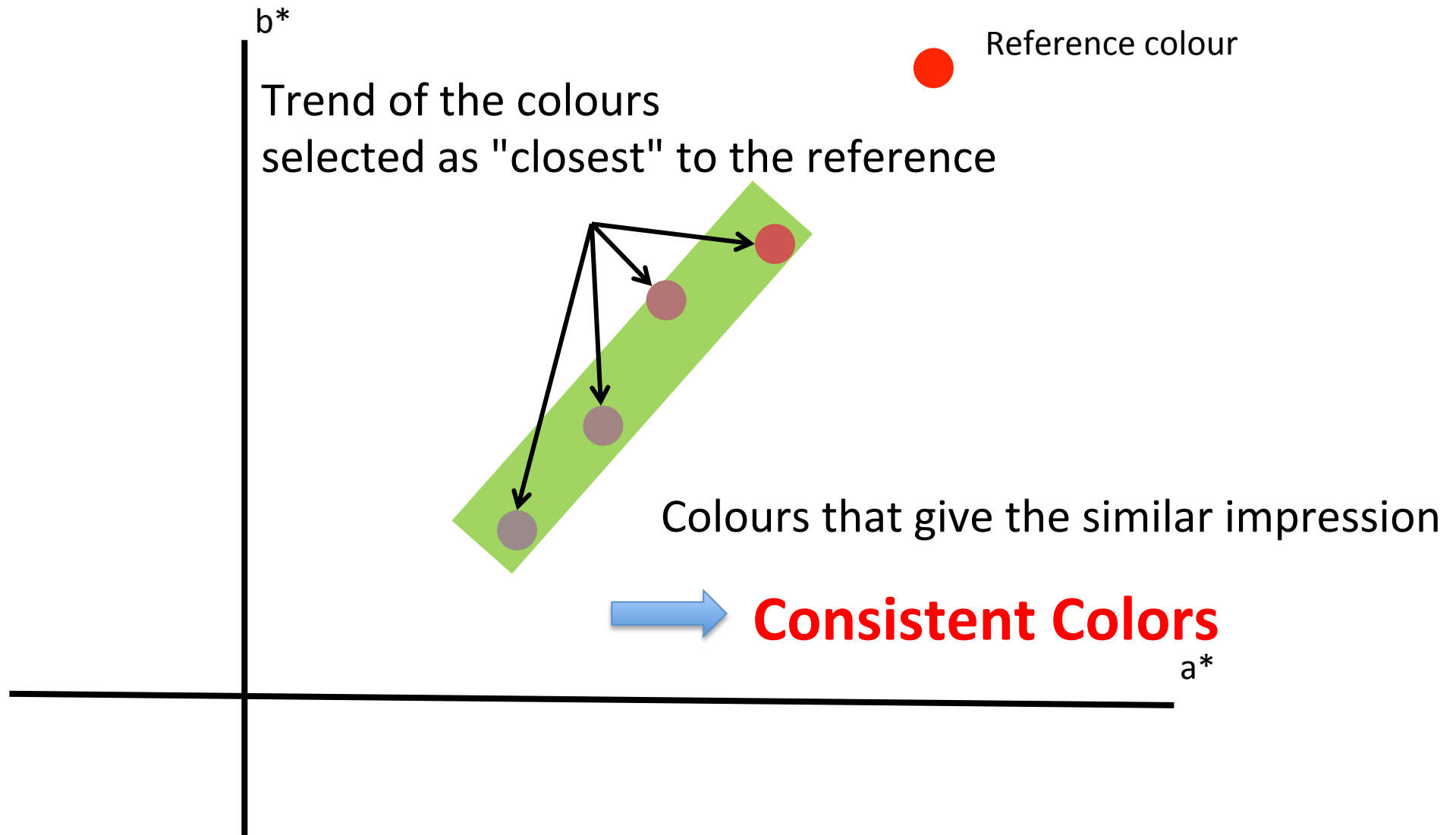
b*

Reference colour

Colours of min. ΔE

Selected colours

Selected colours

Selected colours are not always the colours of min. ΔE

a*

The size of the Color Gamuts are different
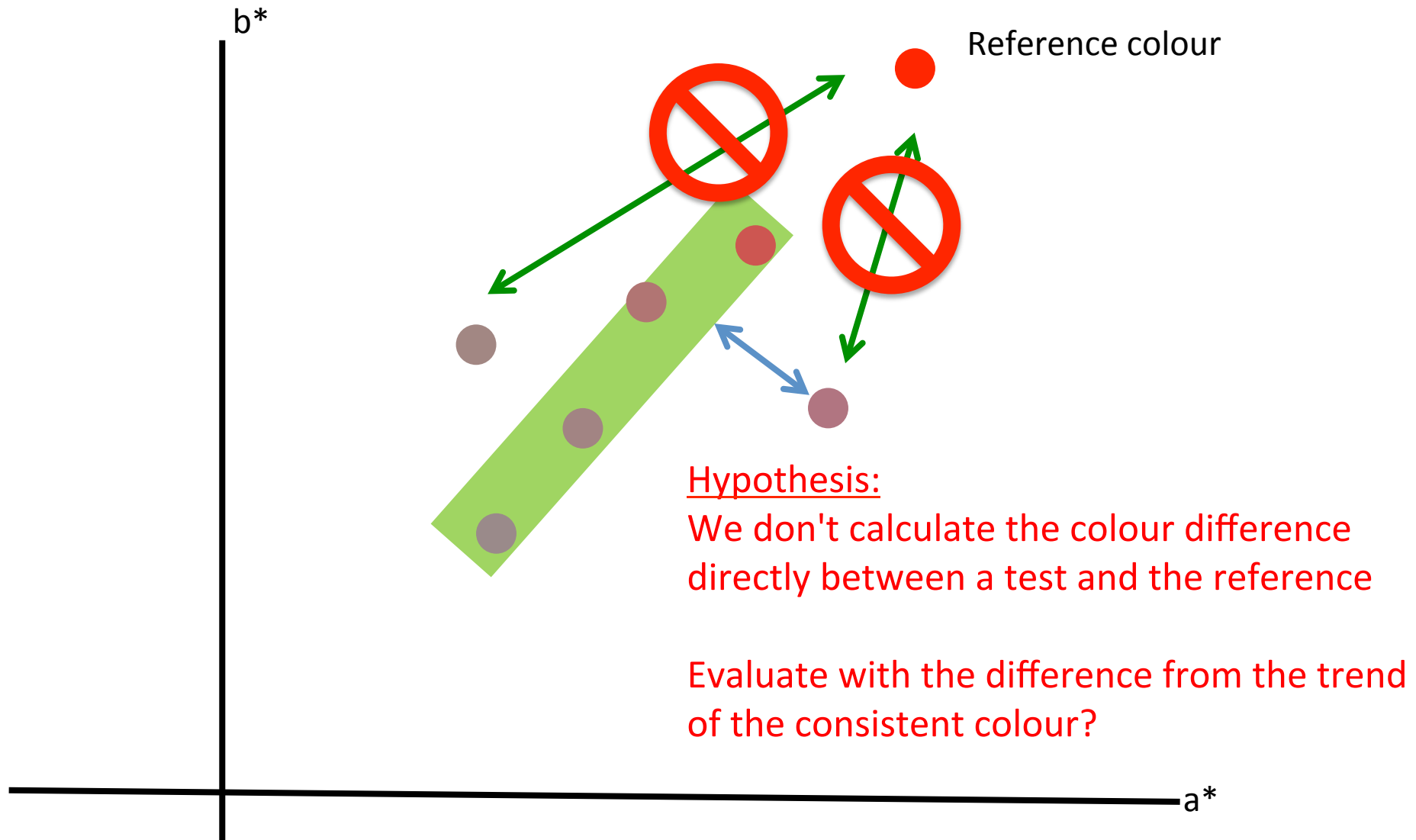

CPRC1

CPRC7

When we would like to map a source color to
a color in a given gamut, we need to find
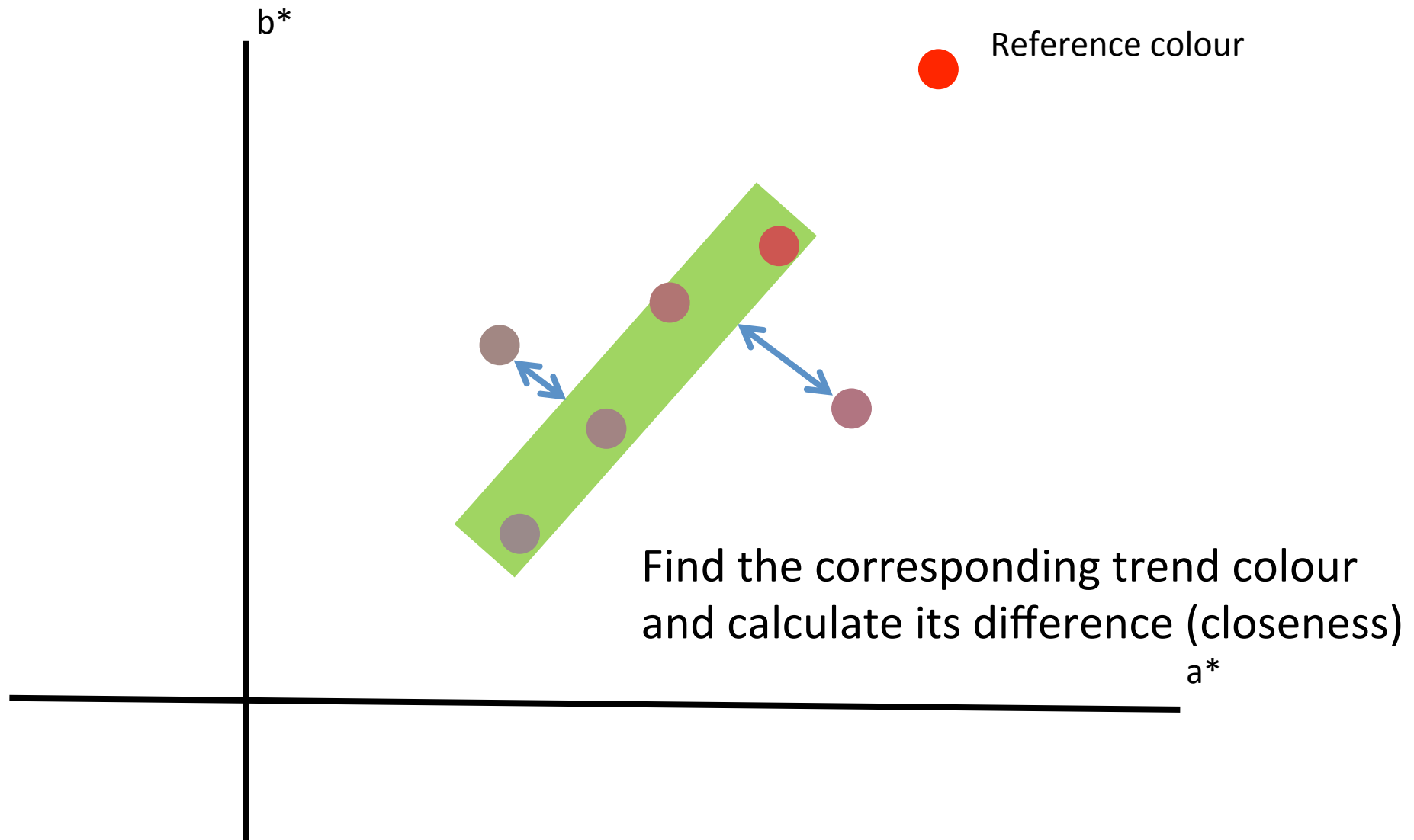the "corresponding" color (= perceptually equal).

PRC1

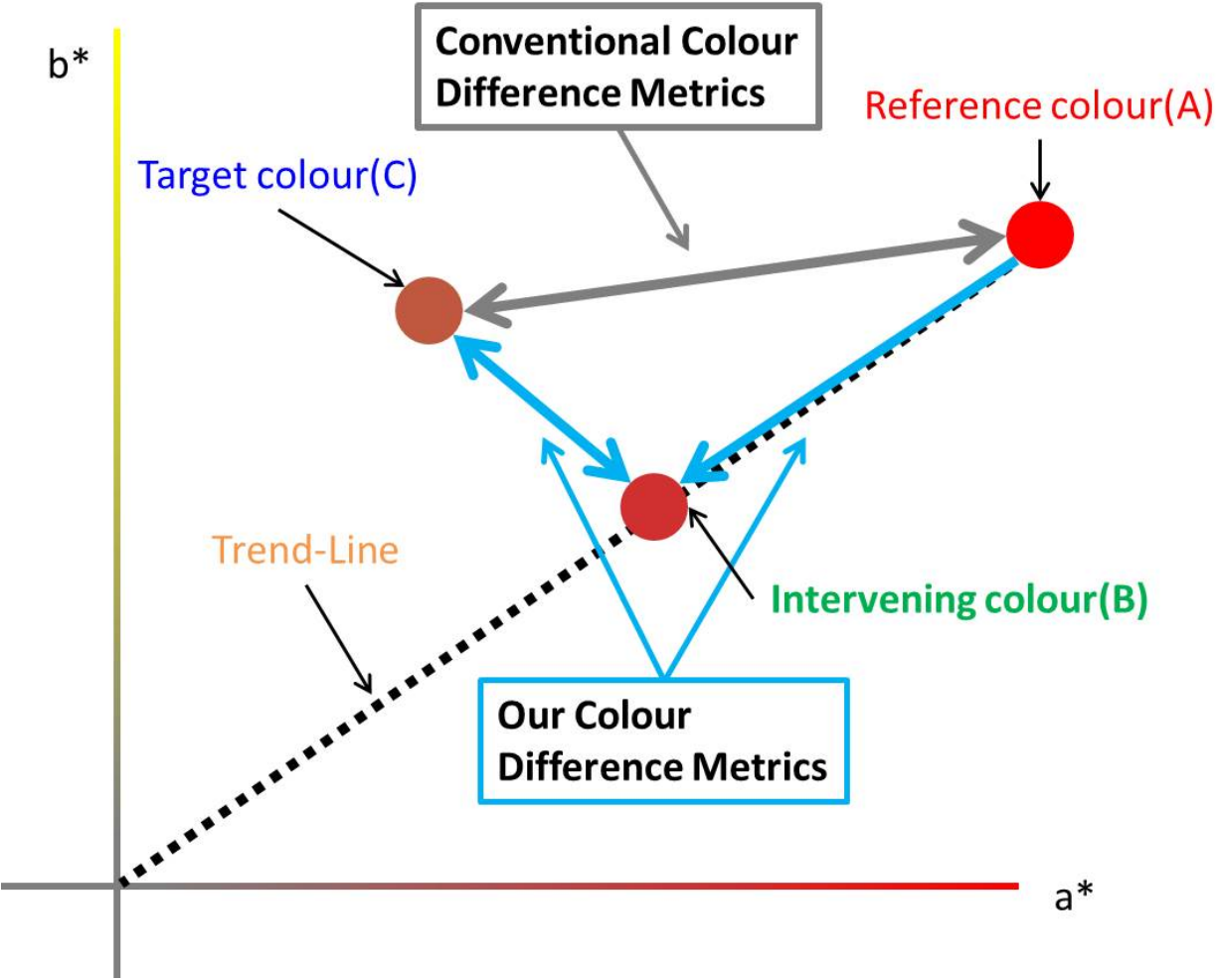# After collecting several closest colours of different gamuts:

b*

Reference colour

Trend of the colours
selected as "closest" to the reference

Colours that give the similar impression

Consistent Colors

a*

Evaluation of a test colour:
"how close to the reference colour"

b*

Reference colour

Hypothesis:
We don't calculate the colour difference directly between a test and the reference

Evaluate with the difference from the trend of the consistent colour?

a*

A metric to evaluate how close a given colour to the reference colour

b*

Reference colour

Find the corresponding trend colour
and calculate its difference (closeness)

a*

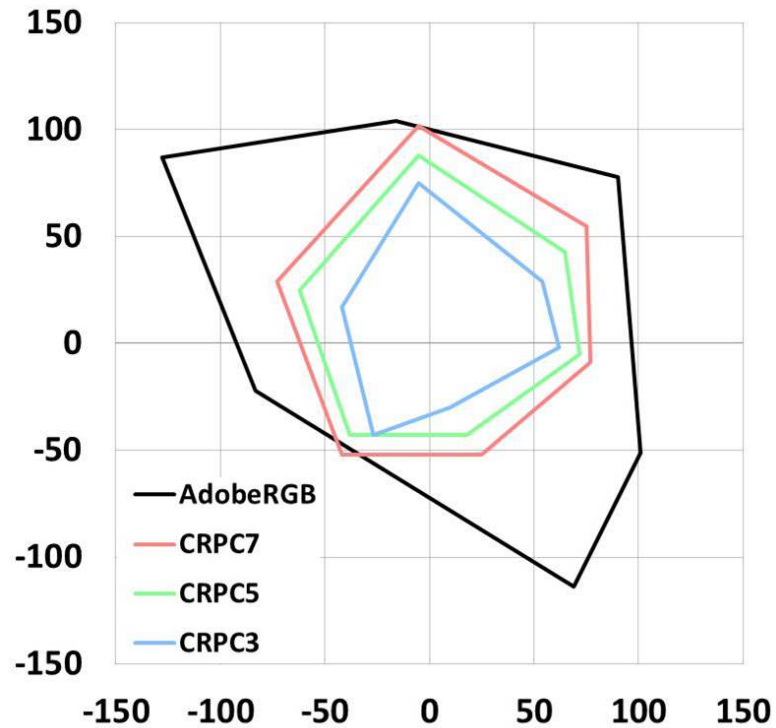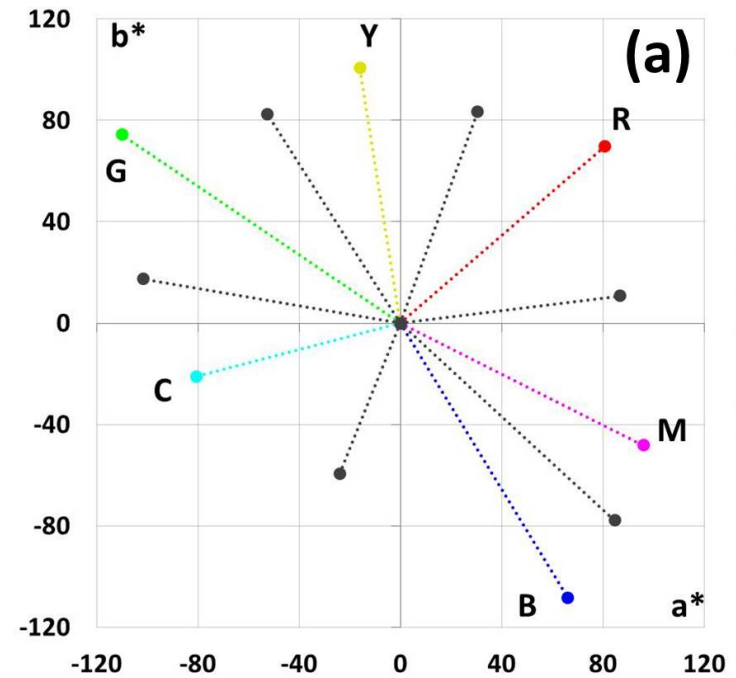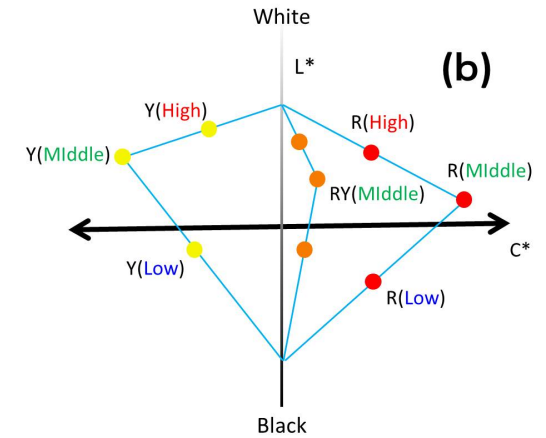# Concept of the color difference based on consistent color locus

Step 1: Find the trend lines
(consistent color loci)

Step 2: Find the "distance" of a test color
from a trend line

Experiment

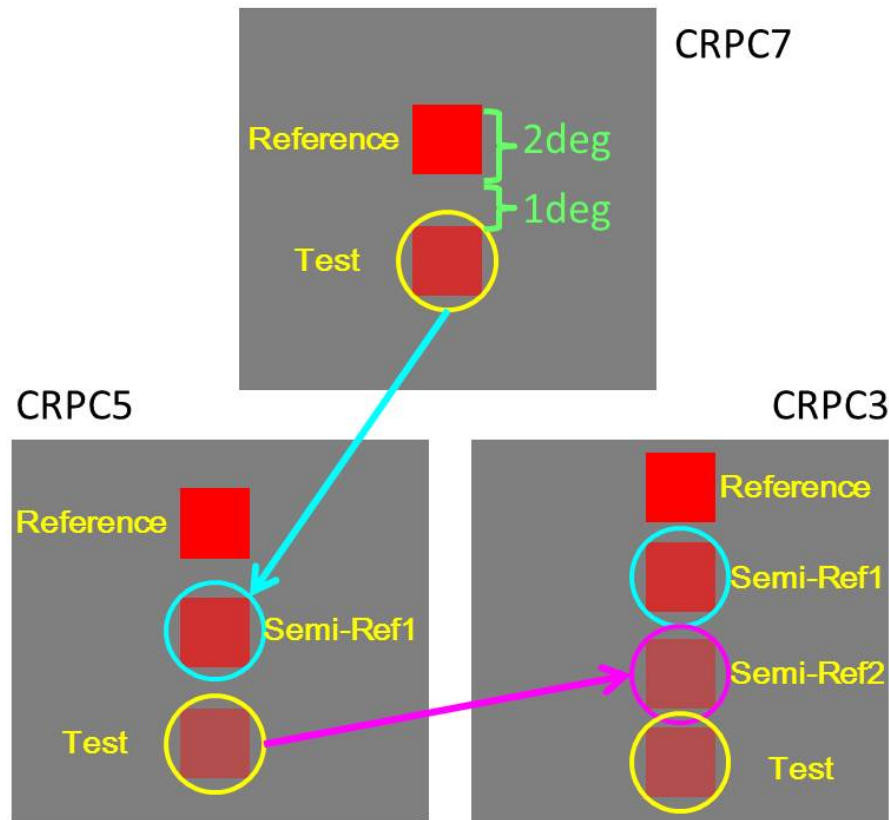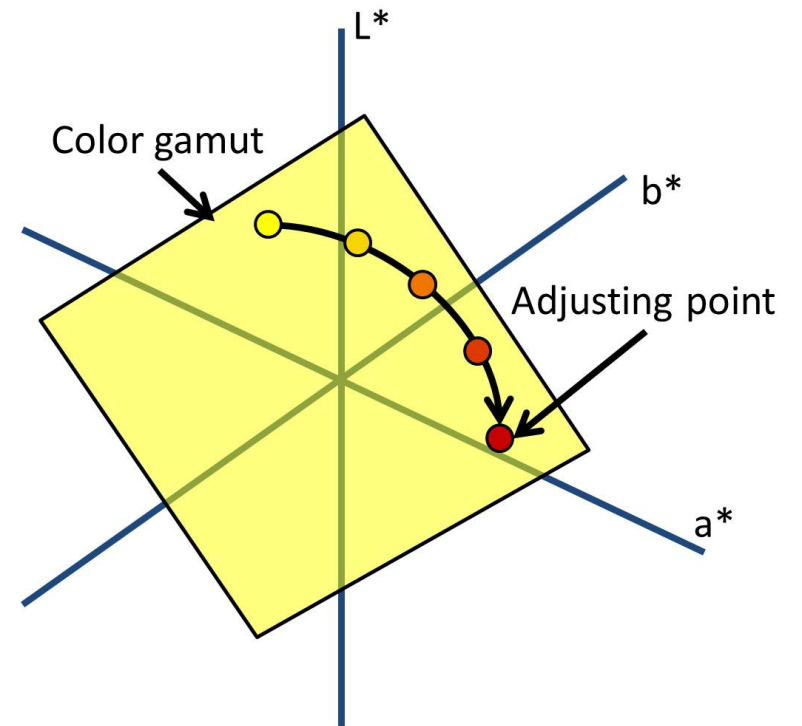Gamuts used in the experiment
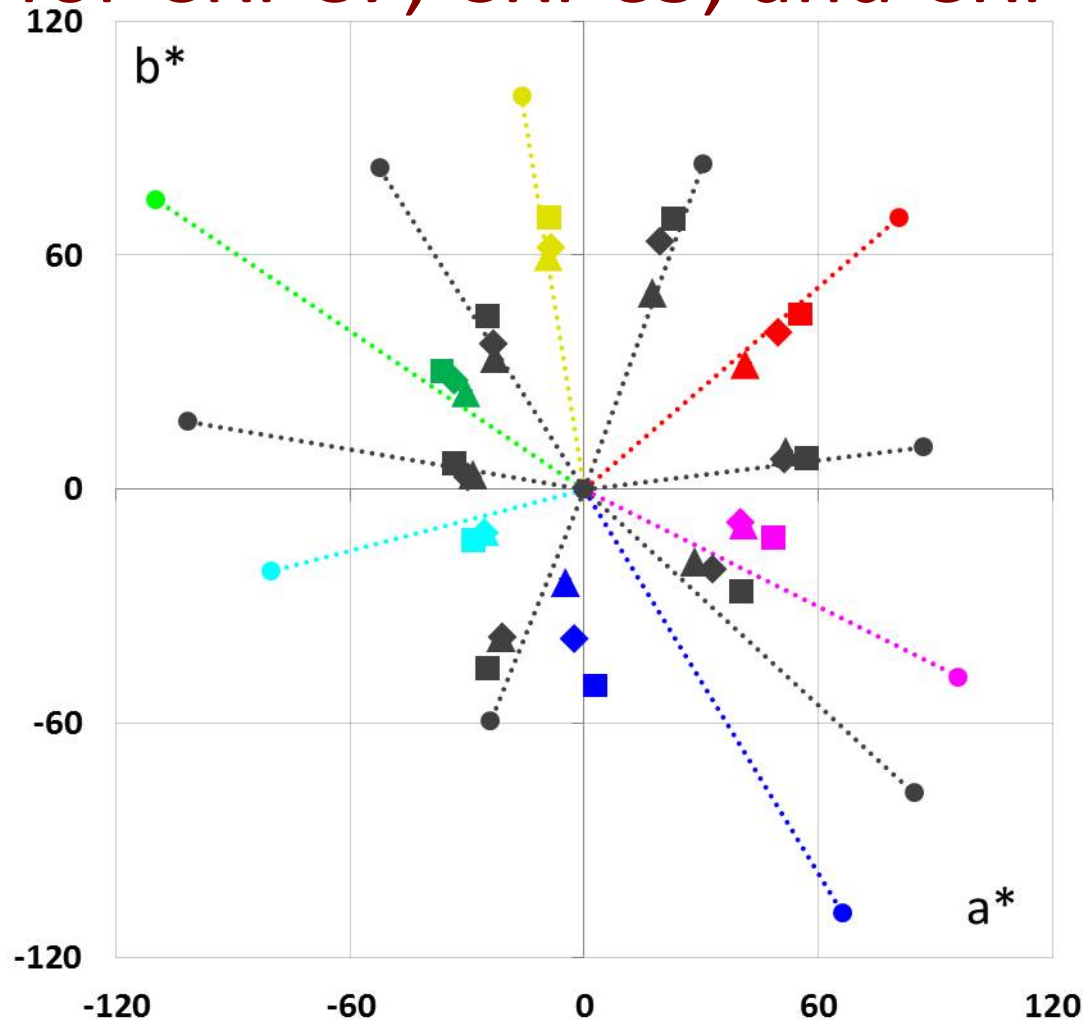
12 target colors (references)

CRPC7

Reference — 2deg

Test — 1deg

CRPC5

Reference

Semi-Ref1

Test

CRPC3

Reference

Semi-Ref1

Semi-Ref2

Test

Configuration of the stimulus
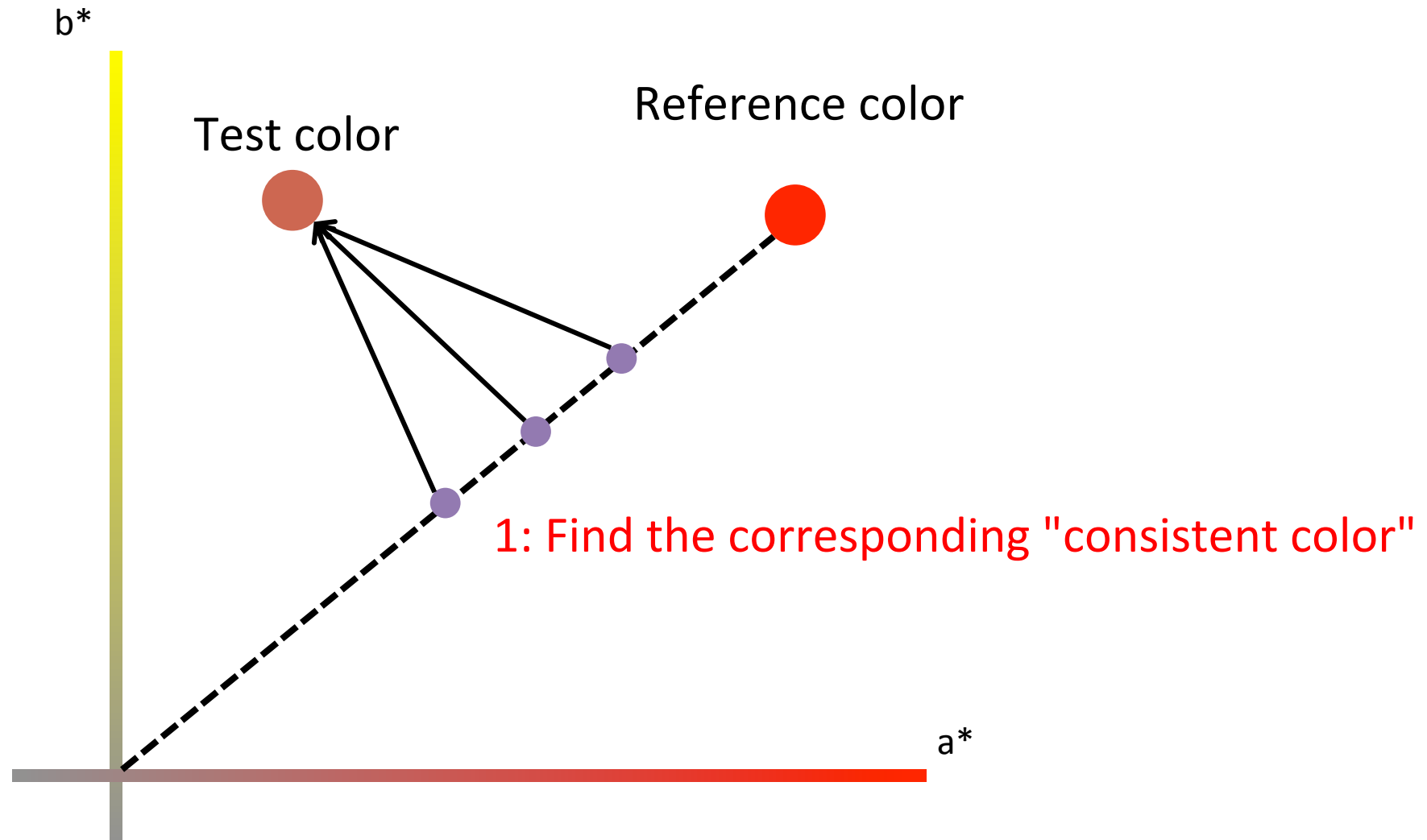
L*

Color gamut

b*

Adjusting point

a*

Test color changed along
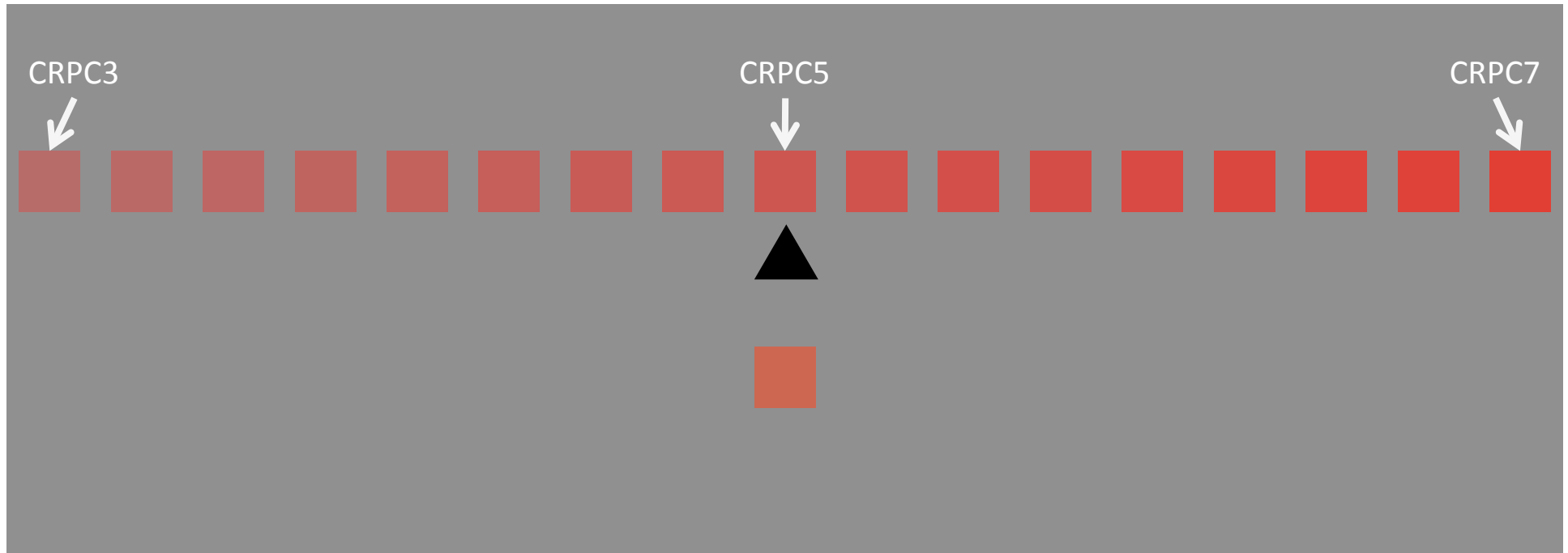the surface of a given gamut

Consistent color loci
(for CRPC7, CRPC5, and CRPC3)

Evaluation of the color (1)

Stimulus configuration

Evaluation of the color (2)

How far is the test colors from a trend-line