

Measurement of Common Appearance (CA) through Colour Naming

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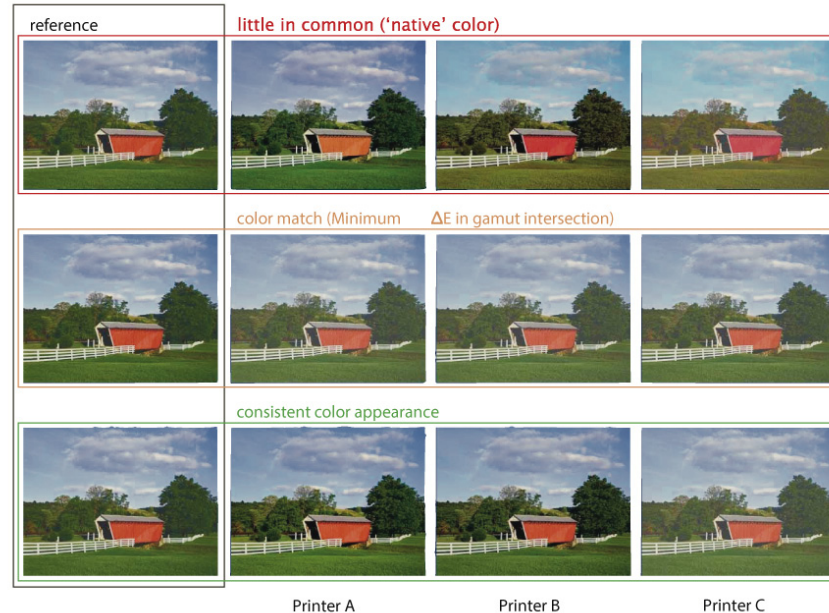
Fogra Forschungsgesellschaft Druck e.V.

www.fogra.org

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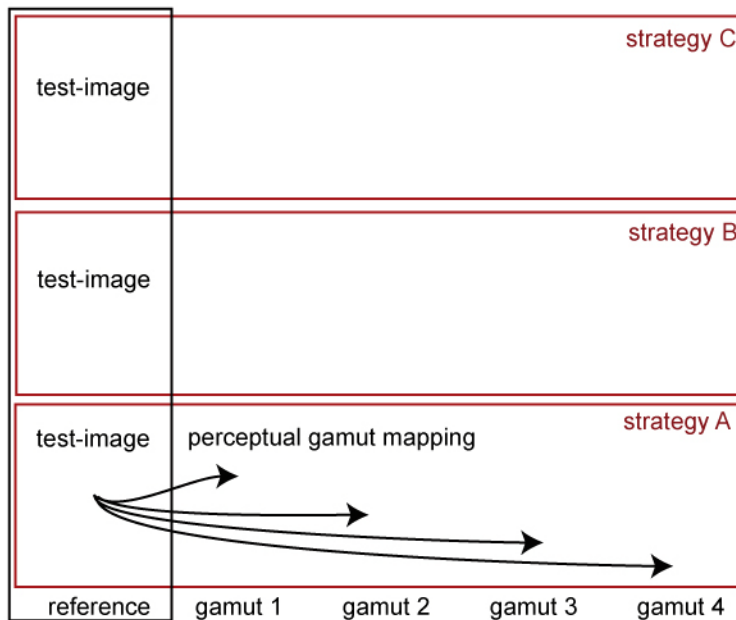
1. Common Appearance - definition

- ⌞ *If an image, for example a company logo is shown on different devices the degree of color consistency amongst this set of stimuli can be defined as common appearance (CA)*



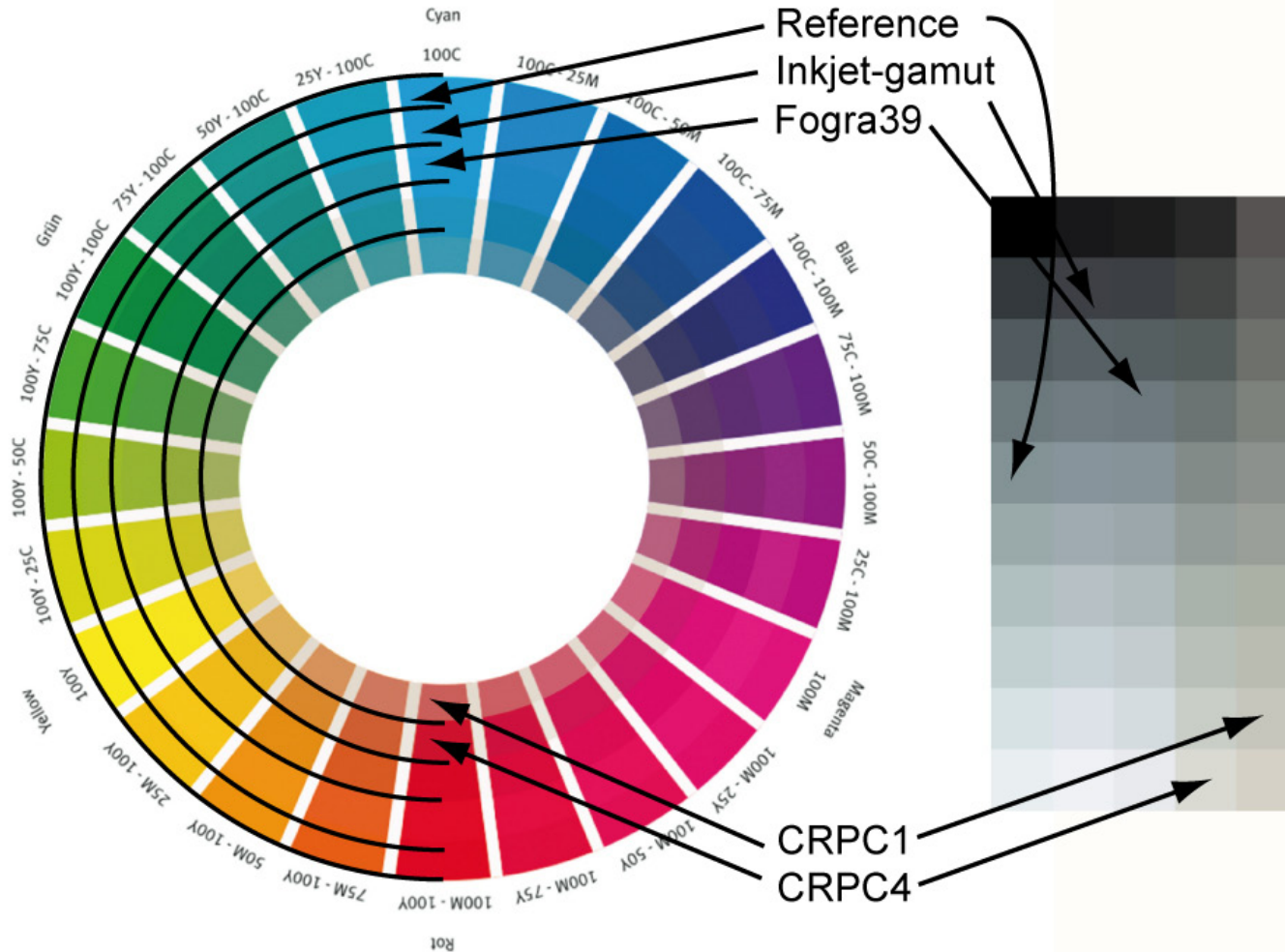
2 Psychophysical Experiment - Principle

- Psychophysical experiment following Morovic image
- Test-image is mapped in several gamuts via perceptual gamut mapping



2.1 Psychophysical Experiment – Test-image

- Test-image and used gamuts are shown
- Colour differences are huge



2.1 Psychophysical Experiment – software

- ⌞ Perceptual mapping of the following software-packages was used

A	X-Rite i1 profiler (v.1.5.6)
B	Heidelberg Colour Tool (v.13.00.31.7)
C	Device Mode (kein Gamut Mapping, native Farberscheinung)
D	basICColour print 3 (v.3.1.0)
E	Color Logic CoPrA 3 (v.3.2.2)
F	Agfa ColourTune (v.8.0.1.8)

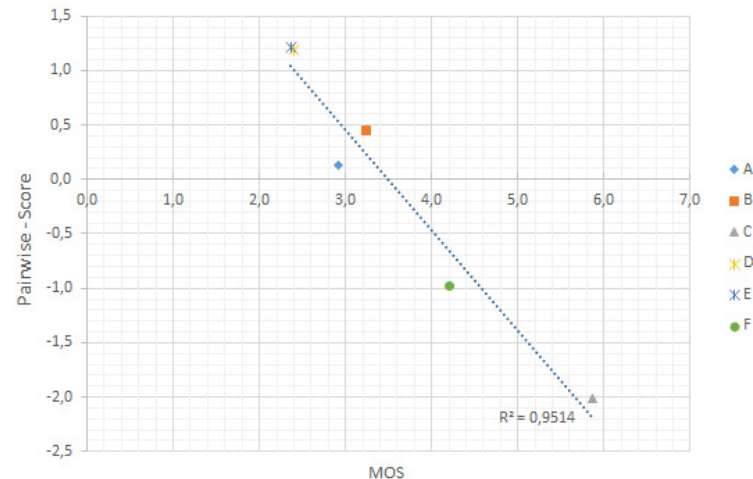
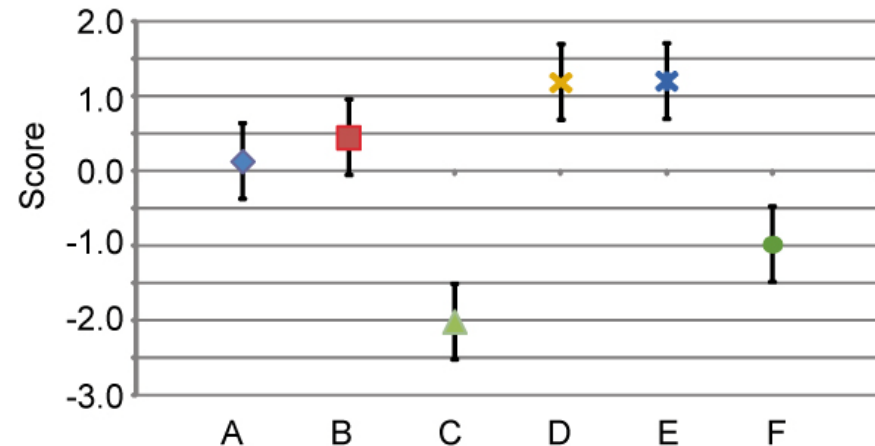
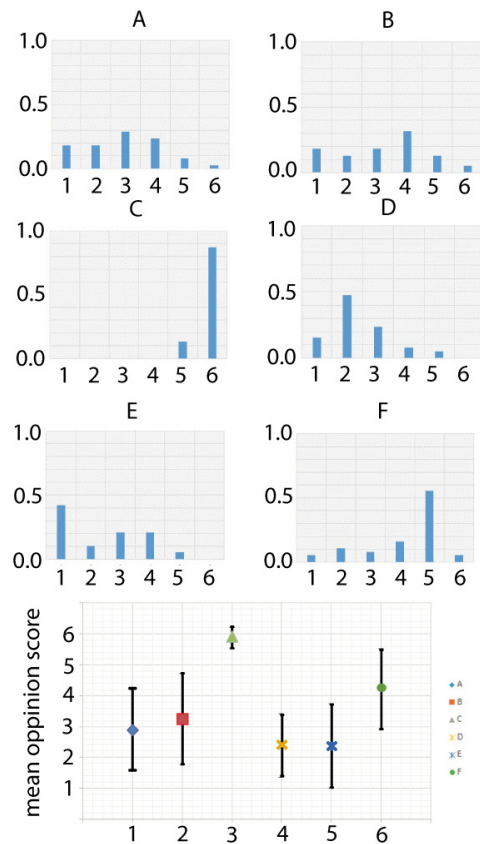
2.1 Psychophysical Experiment – execution

- ▮ Rank order experiment (38 persons / 34 male and 4 female)
 - ▮ ~50% trained in colour matching
- ▮ Pair comparison (forced choice) (15 persons / 12m and 3f)
 - ▮ 12 of the 15 participated in the rank order



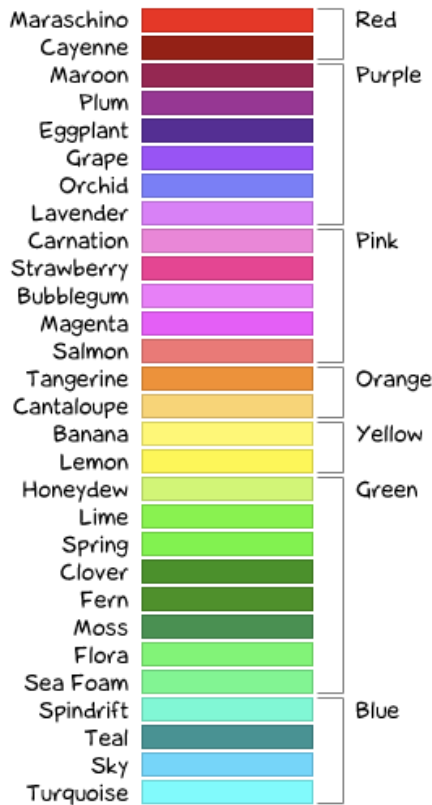
2.2 Psychophysical Experiment – results

- ▮ The mean opinion score and the Z-score are correlated
- ▮ Pair comparison converges faster

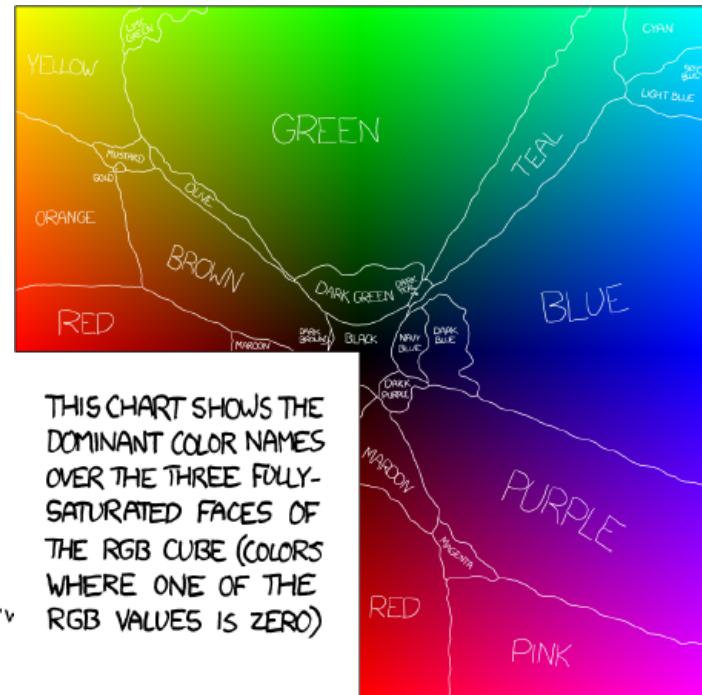


3. Colour Naming

Color names if you're a girl...



Color names if you're a guy...



3. 1 Colour naming - experiment

- Monitor based online experiment (Mylonas & MacDonald)



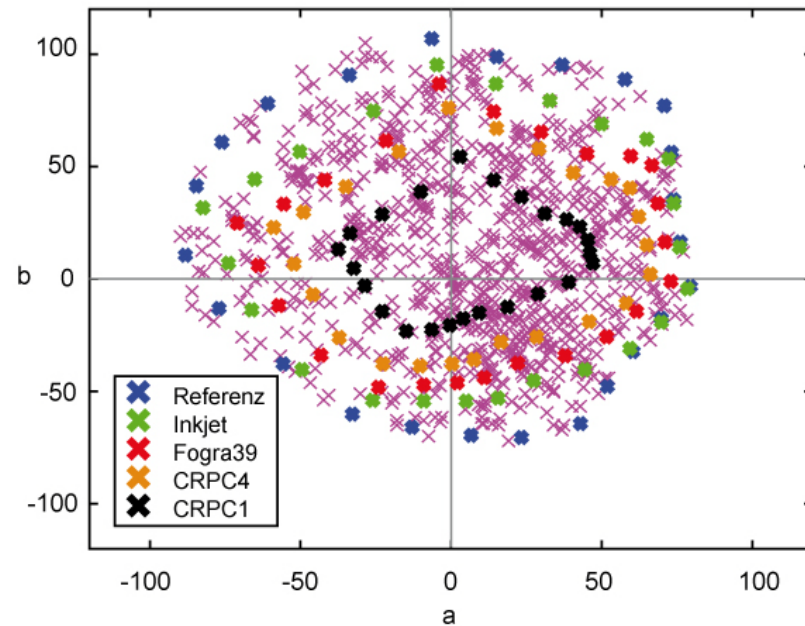
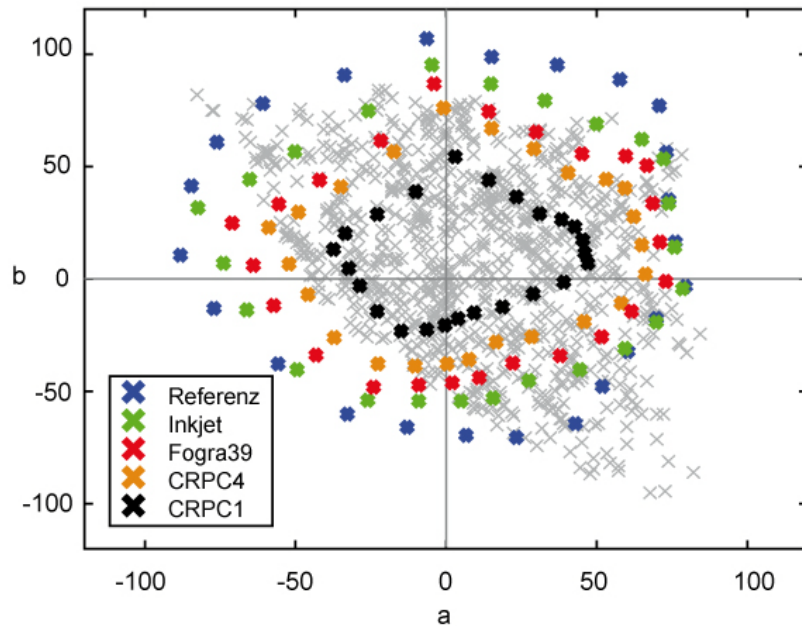
<http://colournaming.com/de/>

3.1 Database of 489 british colour names

Source	colournaming.com						
Author	Dimitris Mylonas		dimitris.mylonas@yahoo.com				
Language	British English						
Date of Data	Jun 14						
To	Philipp Tröster - Fogra		Troester@fogra.org				
	Frequency Order	Mean in CIELAB (sRGB)			Mean RGB		
	Colour Names	m_L*	m_a*	m_b*	m_R	m_G	m_B
	1 purple	35,9536121	41,8622212	-36,714913	118	53	
	2 pink	62,7489121	47,9849469	-11,146343	220	111	
	3 blue	49,9673333	7,36421674	-39,103677	66	117	
	4 green	57,7320512	-32,987741	26,8739819	81	154	
	5 brown	33,9979074	15,5718095	23,8655843	113	70	
	6 lilac	62,5433264	30,5877706	-33,581615	174	133	

3.2 Reshaping of the colour name space

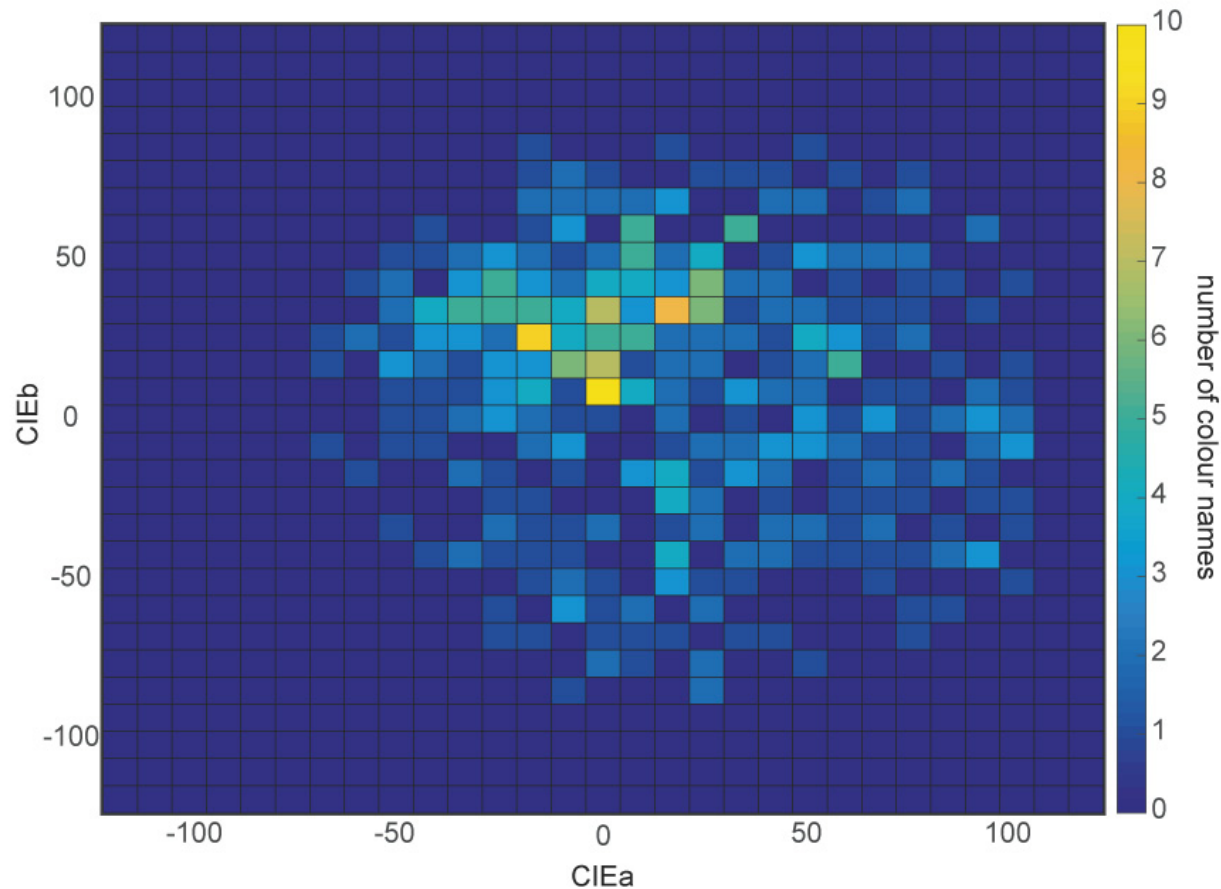
- ▮ Experiments done in sRGB
- ▮ Reshaping towards EP00 via the Chroma of each Lab-value



- ▮ Multiply each chroma with $f = C_{ref} / C_{cn,max}$

3.2 British english colour names

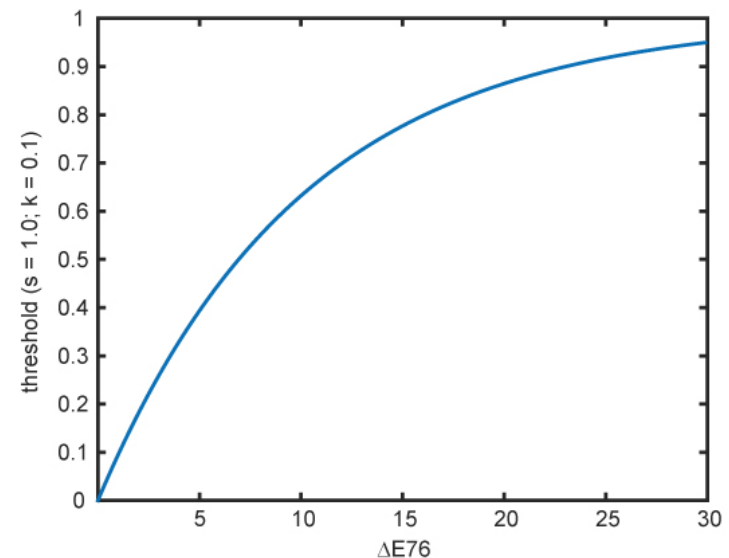
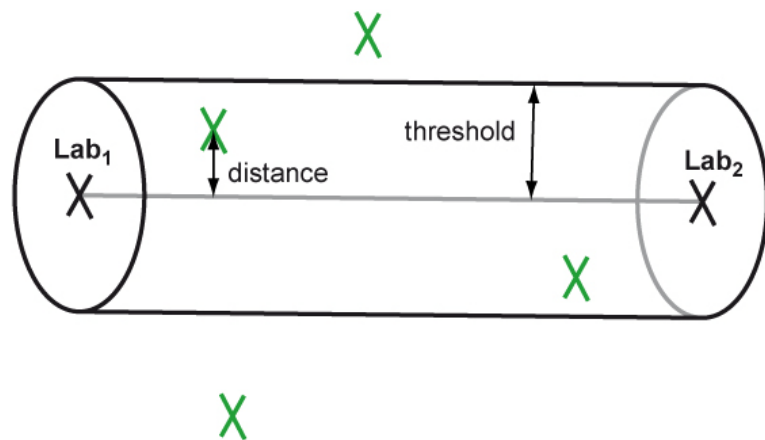
- ▮ Density of colour names binned to $\Delta a = \Delta b = 5$
- ▮ Reshaped to fit EP99 gamut



Mylonas, D., & MacDonald, L. (2010). Online Colour Naming Experiment Using Munsell Samples. In 5th European Conference on Colour in Graphics, Imaging, and Vision and 12th International Symposium on Multispectral Colour Science. Joensuu, Finland: IS&T.

3.3 Crossed colour names

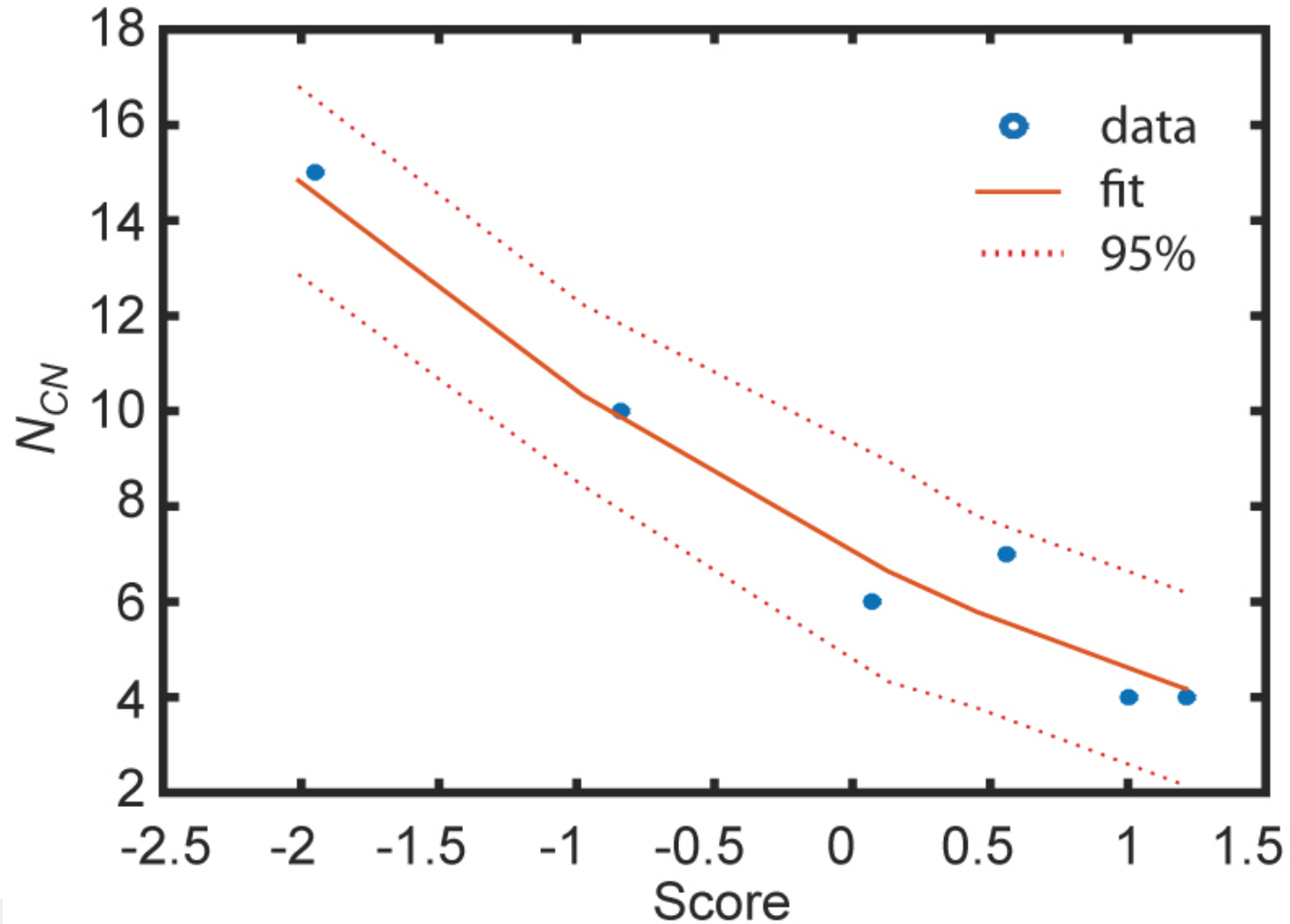
$$\text{threshold}(d; s, k) = s \cdot (1 - e^{-k \cdot d})$$



$$N_{FN} = \sum_{i=1}^{N_{FF}} \sum_{j=i+1}^{N_G-1} \sum_{k=j+1}^{N_G}$$

$$\text{threshold}(\text{Lab}_i, \text{Lab}_j)$$

3.3 Resulting correlation



4. Outline

- ⌞ Good correlation of CA and crossed colour names
- ⌞ More combinations of data-banks and test-images have to be tested
- ⌞ The “reshaping” of the colour-name locations should be examined further

Thank you for your attention!

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