

# Online versus Offline Colour Naming Experiments

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## Introduction

Online colour naming experiments are often criticised for the necessarily uncalibrated colour reproduction of different displays and the uncontrolled viewing environment. In contrast, laboratory-based (offline) experiments are criticised for not reproducing “real-world” monitor settings. In this study, we compare the performance of online and offline colour naming experiments in estimating colour naming functions.

## Methods

Test stimuli subtended approximately 2 degrees of visual diameter and were presented against a neutral grey background. The set of stimuli comprised 589 simulated samples from the Munsell Renotation Dataset plus 11 achromatic samples (Mylonas & MacDonald, 2010). In the online experiment, 447 English observers provided 7405 responses and each observer named only 3.3% of the stimuli. In the offline experiment, 10 English observers offered 4812 responses but each observer named all 600 stimuli. In both experiments, we considered only those distinct responses given by two or more observers with normal colour vision (Mylonas, PhD Thesis, 2019).

## Results

We found a good correspondence between the paired centroids of the 11 Basic Colour Terms (BCTs; Berlin & Kay, 1969) in the online and offline experiments with a mean  $\Delta E_{00} = 4.58$ ,  $SD = 2.83$ . The mean colour difference between BCTs among individuals in the offline experiment was  $\Delta E_{00} = 7.91$ ,  $SD = 3.22$ . There was a significant effect in inter-experimental differences and intra-experimental differences of the offline experiment  $t(10) = 2.58$ ,  $p > 0.02$ .

## Conclusions

Our findings suggest that online and offline experimental methodologies produce consistent results and support the validity of both methods in estimating colour naming functions in laboratory and real-world monitor settings. The inter-experimental variability between online and offline experiments is significantly lower than intra-experimental variability among individuals in the offline experiment.

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