Overview

**Question:** are there temporal-sequence dependent effects in contingent adaptation? Here we attempt to replicate a recent finding (the Anti-McCollough effect) that suggests that manipulating the temporal sequence of inducing stimuli can reverse the aftereffect obtained.

The McCollough Effect (ME) (McCollough, 1965):

Adapting to colored gratings (red) shifts the perception of achromatic gratings (red) and achromatic gratings (red and gray) also shifts the appearance of McCollough effect across two experiments and many naive observers (unlike the ME) that are difficult to recreate in other labs (unlike the ME).

This extremely robust effect has been replicated countless times.

The Anti-McCollough Effect (AME) (Sheth & Shimojo, 2008):

Adapting to colored gratings (red) shifts the perception of achromatic gratings (red and gray) also shifts the appearance of McCollough effect across two experiments and many naive observers (unlike the ME) that are difficult to recreate in other labs (unlike the ME).

The Anti-McCollough Effect (AME) (Sheth & Shimojo, 2008):

Overview

**General procedure**

1. Train subjects on our color-judgment task (needed since we use Psych 101 students). Training gratings are rotated 45 degrees to prevent any interactions with the real stimuli used later.

2. Adapting to colored gratings (red) shifts the perception of achromatic gratings (red).

3. Adapting to colored gratings (red and gray) also shifts the appearance of McCollough effect across two experiments and many naive observers.

4. Adapting to colored gratings (red and gray) also shifts the appearance of McCollough effect across two experiments and many naive observers.

**Experiment 1:** Attempted replication

Duplicates Sheth & Shimojo’s (2008) Experiment 1. Same spatial frequency, colors, grating brightness/contrast, etc.

**Result:** Did not replicate AME

Positive values indicate an ME was seen by the subject.

Negative values indicate an AME.

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**Experiment 2:** Monocular adaptation

Sheth & Shimojo (2008)’s 3rd experiment suggests that a monocularly adapted AME transfers to the unadapted eye (unlike the ME), and is actually stronger in that eye. If so, we may have more success replicating the AME using monocular adaptation.

We added a vigilance task during adaptation: every few seconds a low-contrast gray square was brieﬂy superimposed on the adapting grating; subjects pressed a key when they detected this target.

We also varied the brightness of the adapting red grating across 3 conditions (gray grating was always 1.2 cd/m²).

1. 1 cd/m², because a stronger ME might lead to a stronger AME.
2. 1 cd/m², to replicate the original experiment.
3. 6 cd/m², because a weaker ME might interfere less with AME.

An eyepatch was used to ensure monocular adaptation and testing.

After adaptation we measured the unadapted eye first. Subjects completed 600 trials (150 per eye, before and after adaptation).

**Result:** Did not replicate AME

If anything, data suggest that an initial color/orientation bias contributes to the AME.

**Effect of pre-adaptation bias?**

Subjects with a strong initial (baseline) color/orientation bias might not show an AME (Bhavin Sheth, personal communication, 4-2010). Does our data support this conjecture?

**General Discussion**

A recent finding (the Anti-McCollough effect) that suggests that manipulating the temporal sequence of inducing stimuli can reverse the aftereffect obtained.

Refereces