

PERIPHERAL VISION IS USED MORE THAN CENTRAL VISION TO GET THE GIST OF WHAT IS GOING ON

You have two types of vision: central and peripheral. Central vision is what you use to look at things directly and to see details. Peripheral vision encompasses the rest of the visual field—areas that are visible but that you're not looking at directly. Being able to see things out of the corner of your eye is certainly useful, but new research from Kansas State University shows that peripheral vision is more important in understanding the world around us than most people realize. It seems that we get information on what type of scene we're looking at from our peripheral vision.

Adam Larson and Lester Loschky (2009) showed people photographs of common scenes, such as a kitchen or a living room. In some of the photographs, the outside of the image was obscured, and in others the central part of the image was obscured. The images were shown for very short amounts of time, and were purposely shown with a gray filter so they were somewhat hard to see (**Figure 48.1** and **Figure 48.2**). Then they asked the research participants to identify what they were looking at.



FIGURE 48.1 Central vision photo used in Larson and Loschky research



FIGURE 48.2 Peripheral vision photo used in Larson and Loschky research

Larson and Loschky found that if the central part of the photo was missing, people could still identify what they were looking at. But when the peripheral part of the image was missing, they couldn't say whether the scene was a living room or a kitchen. They tried obscuring different amounts of the photo. They concluded that central vision is more critical for specific object recognition, but that peripheral vision is used for getting the gist of a scene.



Peripheral vision kept our ancestors alive on the savannah

The theory, from an evolutionary standpoint, is that the early humans who survived to pass on their genes were those who, while sharpening a flint or looking up at the clouds, still noticed in their peripheral vision that a lion was coming at them. Those with poor peripheral vision didn't survive to pass on genes.

Recent research confirms this idea. Dimitri Bayle (2009) placed pictures of frightening objects in subjects' peripheral vision or central vision. Then he measured how long it took for the amygdala (the emotional part of the brain that responds to frightening images) to react. When the frightening object was shown in the central vision, it took from 140 to 190 milliseconds for the amygdala to react. But when objects were shown in peripheral vision, it took only 80 milliseconds for the amygdala to react.

CENTRAL AND PERIPHERAL VISION FOR YOUR AUDIENCE

In order to have maximum impact, you want to know what is likely to be in the central and peripheral vision of your audience. The more important your presentation is, the more time you should spend researching and adjusting the visual field of your audience. The best speakers don't leave this to chance. If possible, go to the room you will be speaking in, and sit in different seats in the audience. What will be in the audience's central vision? What will be in their peripheral vision? When people get the gist of the scene in their peripheral vision, what will that gist be? That the session is professional? That the speaker is the star? Are there distractions in the peripheral vision? You hope that when you give your presentation, you will be right in people's central vision. In order to make that happen, you need to make sure that the peripheral visual field gives the right impression and doesn't distract.

Takeaways

- * What people see from the edges of their vision is as important as what is in the center.
- * Take time to view the room from the audience's perspective and make any adjustments necessary to make sure that the peripheral visual field will not distract from you as the speaker.
- * If you move around during your talk, it will grab the audience's attention. Think through how you want to use this. If you are moving constantly, it will distract from your talk.

THERE'S A SPECIAL PART OF THE BRAIN JUST FOR RECOGNIZING FACES

Imagine that you're walking down a busy street in a large city when you suddenly see the face of a family member. Even if you were not expecting to see this person, and even if there are dozens or even hundreds of people in your visual field, you will immediately recognize him or her as your relative. You'll also have an accompanying emotional response, be it love, hate, fear, or otherwise.

Although the visual cortex is huge and takes up significant brain resources, there is an additional part of the brain whose sole purpose is to recognize faces. Identified by Nancy Kanwisher (1997), the fusiform face area (FFA) allows faces to bypass the brain's usual interpretive channels and helps people identify faces more quickly than objects. The FFA is also near the amygdala, the brain's emotional center.



People with autism don't view faces with the FFA

Research by Karen Pierce (2001) showed that people with autism don't use the FFA when looking at faces. Instead, they use pathways in the brain and visual cortex that are normally used to recognize and interpret objects but not faces.

FACES CAPTURE ATTENTION AND COMMUNICATE EMOTION

Because of the FFA, people will pay attention to faces. Consider using photos and pictures of people's faces on your slides. In order to stimulate the FFA, the face needs to look like a face; in other words, it needs to have two eyes, a nose, and a mouth. For maximum recognition, use faces that are full front. Faces at an angle or in profile are not as easily recognized by the FFA.

Don't use faces that are distorted unless you want to convey a negative message. One of my clients once used a face that was made up of the left half of one person's face and the right half of another's. It was attention getting, but also very creepy.

Because the FFA is so close to the amygdala, faces communicate emotion directly to the emotional centers of the brain. A picture of someone showing emotion—whether happy, sad, disgusted, or afraid—will communicate more quickly and deeply than words can.



People are born with a preference for faces

Research by Catherine Mondloch (1999) shows that very young children (newborns less than an hour old) have a preference for looking at something that has facial features.

WE LOOK WHERE OTHERS LOOK

Eye-tracking research shows that if a face in a picture is looking away from us and toward something else on the screen, then we tend to also look at the other object on the screen.

If you as the presenter turn and look at the screen behind you, then your audience will look at the screen too. This is a good thing if you are trying to draw the audience's attention to something on the screen. But if you keep looking at the screen behind you because you are nervous or because you have forgotten what is on the screen, then you are just distracting the audience from listening to you.



A tip from the pros

If possible, have a monitor in front of you so you can see what the audience is looking at without turning to look at the screen.

The best presenters and public speakers are so practiced with their presentation that they don't have to look at the screen at all. I've seen presenters subtly click a remote in their hand that you can't see. They don't have any monitor in front of them. They know what comes next and what is appearing on the screen behind them. They are so confident that they just smoothly continue talking through every slide.

Takeaways

- * Use photos or drawings of faces to grab attention and communicate emotion.
- * For maximum impact, have the face looking straight out at the audience.
- * Don't look at the screen behind you unless you want the audience to focus on the screen.
- * Have a monitor in front of you so you can see what your audience sees and you don't have to turn around.

50

RED AND BLUE TOGETHER ARE HARD ON THE EYES

When lines or text of different colors are projected or printed, the depths of the lines may appear to be different. One color may jump out, whereas another color appears recessed. This effect is called *chromostereopsis*. The effect is strongest with red and blue, but it can also happen with other colors; for example, red and green. These color combinations can be hard and tiring to look at or read. **Figure 50.1** shows some examples of chromostereopsis.

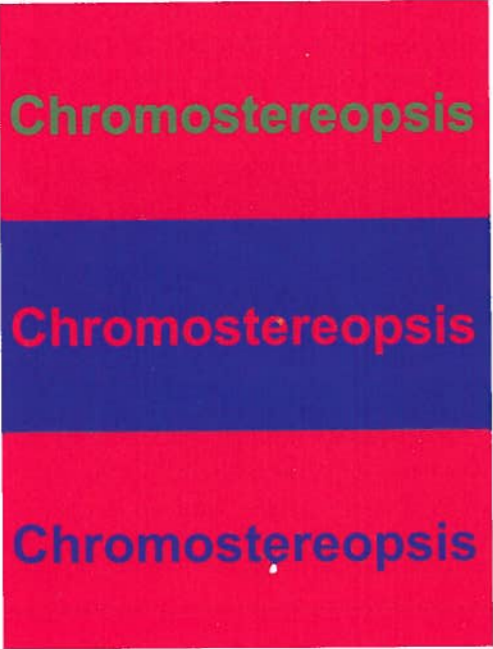


FIGURE 50.1 Chromostereopsis can be hard on the eyes.

Takeaways

- * Avoid putting blue and red or green and red near each other on a slide.
- * Avoid blue or green text on a red background, and red or green text on a blue background.

51

NINE PERCENT OF MEN AND 0.5 PERCENT OF WOMEN ARE COLOR BLIND

The term color blindness is actually a misnomer. Most people who are color blind are not blind to all colors but rather have a color deficiency that makes it hard for them to see differences between some colors. Most color blindness is hereditary, although it can also be acquired through disease or injury. Most of the color genes are on the X chromosome. Since men have only one X chromosome and women have two, men are more likely to have problems with color vision than women.

There are many different kinds of color blindness, but the most common is a difficulty distinguishing between reds, yellows, and greens. This is called red-green color blindness. Other forms—such as problems distinguishing blues from yellows, or where everything looks gray—are very rare.

Figure 51.1 shows a map of winter driving conditions (from the Wisconsin Department of Transportation) as it appears to someone who has no color blindness. **Figure 51.2** shows the same map as a person with red-green color blindness would see it, and **Figure 51.3** shows the same map as a person with blue-yellow color deficiency would see it. Notice that the colors are different.

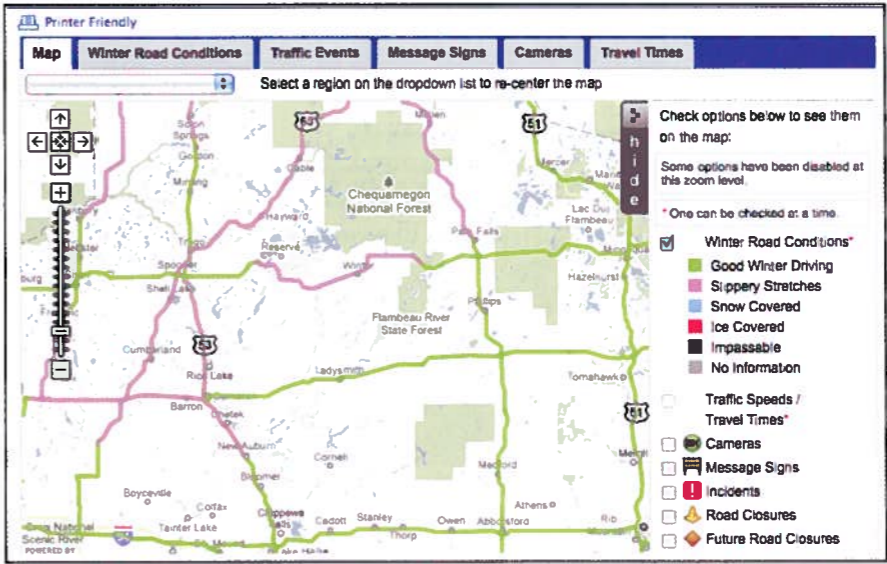


FIGURE 51.1 Full-color vision

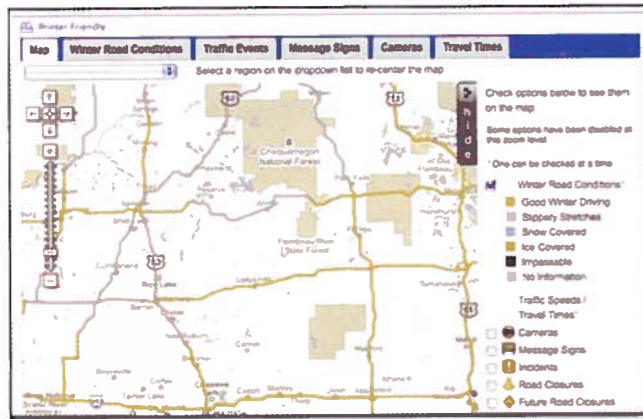


FIGURE 51.2 Red-green color deficiency

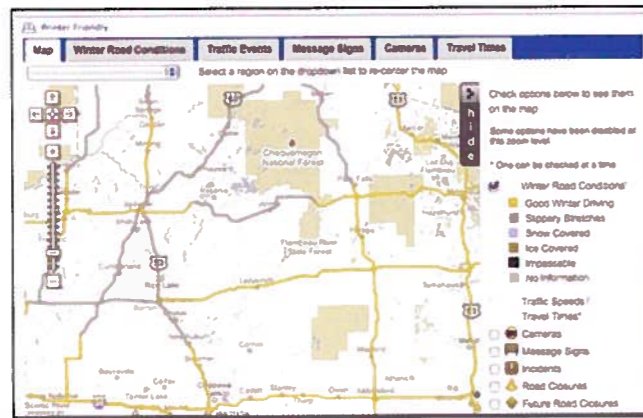


FIGURE 51.3 Blue-yellow color deficiency

The rule of thumb is that wherever you use color to give specific meaning, you need a redundant coding scheme—for example, color *and* line thickness—so that people who are color blind will be able to decipher the code without needing to see specific colors.

Another approach is to pick a color scheme that works for people who have the various types of color blindness. **Figure 51.4**, **Figure 51.5**, and **Figure 51.6** show diagrams of the spread of influenza for a particular week. Colors were purposely picked so that they would look the same for people regardless of the type of color blindness they have, and even if they are not color blind. The three instances of the diagram look almost exactly the same.

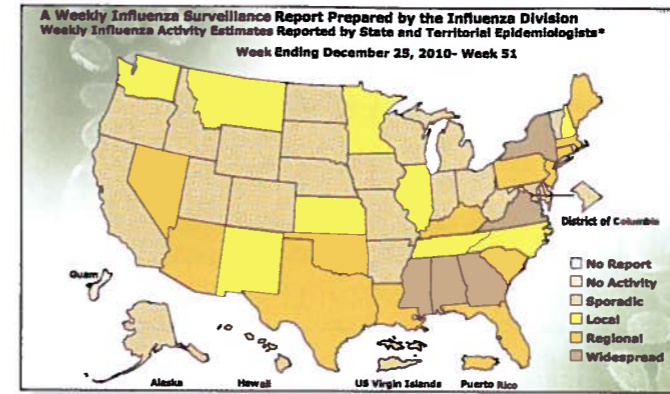


FIGURE 51.4 Full-color vision (Courtesy of www.cdc.gov)

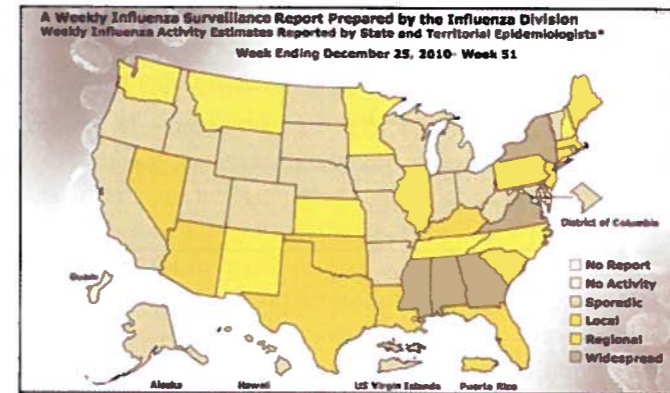


FIGURE 51.5 Red-green color deficiency (Courtesy of www.cdc.gov)

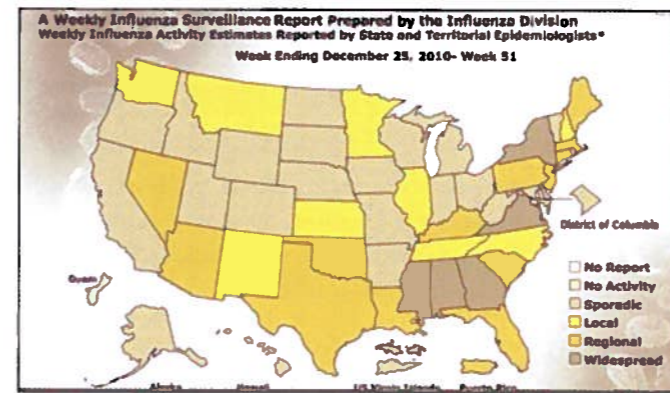


FIGURE 51.6 Blue-yellow color deficiency (Courtesy of www.cdc.gov)



Use web sites to check for color blindness effects

There are several sites you can use to check how your images will appear to someone who has color blindness. Here are two I recommend:

www.vischeck.com

<http://colorfilter.wickline.org>

Takeaways

- * Check your images with www.vischeck.com or <http://colorfilter.wickline.org> to see how they will look to someone who is color blind.
- * If you use color to imply a certain meaning (for example, green areas of a map mean that influenza levels were low, and red areas mean that influenza levels are high), think up a redundant coding scheme (areas in red also have a box around them).
- * Consider using colors that work for everyone; for example, using varying shades of browns and yellows and avoiding reds, greens, and blues.

52

THE MEANINGS OF COLORS VARY BY GROUP AND CULTURE

Many years ago I worked with a client who had created a color map of the different business regions for their company, showing the total revenue for the quarter for each region. Yellow was for the eastern part of the United States, green for the central states, and red for the western states. The VP of Sales got to the podium and started his slide show to the financial and accounting staff of the company. Up came the colored map, and a gasp could be heard in the auditorium, followed by the buzz of urgent conversation. The VP tried to continue his talk, but he had lost everyone's attention. They were all talking among themselves.

Finally someone blurted out, "What the heck is going on in the West?"

"What do you mean?" the VP asked. "Nothing is going on. They had a great quarter."

To an accountant or financial person, red is a bad thing. It means that they are losing money. The presenter had to explain that he had just randomly picked red.

Colors have associations and meanings; for example, red means "in the red" or financial trouble, or it could mean danger or stop. Green means money or "go." Pick colors carefully, since they have these meanings. And different colors might mean different things to subgroups.

If you are designing for people in different parts of the world, you have to also consider the color meanings in other cultures. A few colors have similar meanings everywhere (gold, for example, stands for success and high quality in most cultures), but most colors have different meanings in different cultures. For example, in the United States white signifies purity and is used at weddings, but in other cultures white is the color used for death and funerals. Happiness is associated with white, green, yellow, or red, depending on the part of the world you are in.



Check out the David McCandless color wheel

David McCandless of [InformationIsBeautiful.net](http://www.informationisbeautiful.net) has a color wheel that shows how different colors are viewed by different cultures: <http://www.informationisbeautiful.net/visualizations/colours-in-cultures/>.

➔ Research on color and moods

Research shows that color affects mood. The restaurant and hospitality industry has studied this a lot. For example, in the United States, orange makes people agitated, so they won't stay long (useful in fast food restaurants). Browns and blues are soothing, so people will stay (useful in bars). It's not clear if using a color as the background in a slide presentation is enough color to affect mood. But the color of the room you are in will affect the mood of your audience.

Takeaways

- * If you are speaking in a culture that is not your own, check the McCandless chart and consider modifying your color choices.
- * If you're using a very large screen, think about the background color of your slides. Avoid orange (unless you want your audience agitated and restless).

“Hell is a half-filled auditorium.”

—Robert Frost

HOW PEOPLE REACT TO THE ENVIRONMENT

Anyone who has ever presented in a big room or auditorium that is only half filled or less will agree with the quote above from the poet Robert Frost. Take the same presentation and the same presenter and put them in two different environments, and you will have two (sometimes very) different experiences. Both the speaker and the audience can be very affected by the environment in which the presentation is delivered.