

Alexandra Kirsch
PSY 27 - Perception
Blog #2

What Colors Symbolize

At the beginning of the lecture on perceiving color, Professor Alzahabi mentioned that different colors have different meanings. For example, the color purple is associated with royalty. [*Cue the sound of neurons firing.*] Is that why History is purple to me? Is it because that was where I first learned about royalty?

When I was in middle school, I had a different colored binder for each class—Math was red, Science was green, English was blue, French was yellow, and History was purple. I don't have color synesthesia, and I don't know why I chose those specific colors for those classes—I just made the association and stuck with it. I enjoyed having a color system, because it kept me organized, and I was disappointed when the system fell apart in college (What color is Computer Science? How do I differentiate between two courses within the same subject, such as Social Psychology and Experimental Psychology?). Eventually I moved on and created a new system. Instead of using paper and binders, I learned to use electronic documents and folders on my computer, and instead of associating my courses with colors, I learned to associate them with their course numbers (e.g., Perception is PSY27). However, the simplicity of this switch made me question my initial color association—was Math *really* red, or was red just an arbitrary color I assigned to Math? Is History purple because purple is associated with royalty, or was that also an arbitrary association?

I'm pretty sure all those associations were arbitrary, but now I'm wondering if other, more universally accepted associations are also arbitrary. Fortunately, many researchers have explored color associations (especially those involving the color red) and published their

findings, so I can find out which associations are arbitrary, which are acquired, and which are innate.

We'll start with the color purple and its association with royalty. This association was apparently acquired because purple dye was rare and expensive and therefore only royalty could afford it. Nice and straightforward—a historical fun fact—but the association has no useful implications for me.

Another straightforward association is that between red and anger. Studies have shown that men wearing red are rated as more angry, aggressive, and dominant than men wearing blue or gray (Wiedemann, Burt, Hill, & Barton, 2015). Wiedemann et al., (2015) explain that red is associated with anger because people's faces turn red when they're angry. Similarly, Elliot (2015) remarks that red is associated with aggression because an increase in testosterone reddens the face. These are simple, acquired associations, and they make complete sense.

A less straightforward association is that between the color red and food. Researchers have found that red influences both food and beverage consumption (Elliot, 2015). Some researchers speculate that the association was *acquired* because red is the color of ripe fruits (Kuniecki et al., 2015). Personally, I'm not a big fan of this rationale, because ripe fruits can also be many other colors, such as orange, yellow, green, blue, and purple. The association seems arbitrary. However, others speculate that the association between red and food was acquired because people's *innate* attentional bias towards red prompted fast food companies to use the color in their branding (Wiedemann et al., 2015). I prefer this explanation. Perhaps this is also why stop signs and some traffic lights are red—red attracts your attention. On the other hand, it may also be because the color red contrasts the blue sky and green foliage, making it more

visible in a natural environment (Kuniecki et al., 2015). Both reasons seem valid, and I would not be surprised if both reasons were considered in the decision.

Quick tangent: *blue light* is also associated with attention because it activates brain regions associated with attentional processing (Elliot, 2015). This is an innate association, and it is also an association that has to do with light rather than pigment.

Now, back to red and attention! *Why* is the color red associated with attention?

Researchers have found that an attentional bias for the color red is found in early infancy (Wiedemann et al., 2015). Some researchers speculate that this is an evolutionary trait developed to help humans respond to situations that might be dangerous, such as those involving fire and blood (Kuniecki et al., 2015). This suggests that the acquired association is actually between the color red and *danger*, and a *result* of that association is improved attention, perhaps instigated by *fear*. An interesting consequence of this association is that improved attention may also improve the speed of a motor response. Researchers noticed that participants responded faster and more accurately to targets that followed a red cue in a dot-probe task because the color captured their attention (Kuniecki et al., 2015). However, some researchers have found that the color red may also *impair* motor responses by causing anxiety (Kuniecki et al., 2015).

Another interesting consequence of an association with red is with sports performance. Researchers have found that sports players who wear red perform better (Elliot, 2015). Some researchers speculate that this tendency is a result of referees' attentional bias towards red (Kuniecki et al., 2015). Alternative possibilities may be that the team wearing red is perceived as more aggressive and dominant, creating a self-fulfilling prophecy, or the other team experiences fear and anxiety in the presence of the red uniforms, which hinders their performance.

Finally, to zoom out... Some people theorize that the *meaning* of colors is *associated* with their *wavelengths*: red, orange, and yellow are arousing and warm because they have the longest wavelengths, whereas green, blue, and violet are relaxing and cool because they have the shortest wavelengths (Elliot, 2015). Based on that theory, maybe I chose the red binder for Math because Math is challenging, and I chose the blue and purple binders for English and History because reading and writing are relaxing. This is merely speculation, which makes me wonder if most associations start out as arbitrary and people come up with explanations for them to make them seem acquired. This response is a common tendency amongst people—we like to assign meaning everywhere, even if it isn't there. Fortunately, some of these associations, whether they began as arbitrary or innate, have positive implications of which we can take advantage. For example, I can take some notes with a red pen, so the words capture my attention, and I can wear a blue shirt during my next exam to calm my nerves. Even if those associations are entirely arbitrary, as long as the colors have meaning to me, I can count on a placebo effect.

References

- Elliot, A. J. (2015). Color and psychological functioning: a review of theoretical and empirical work. *Frontiers in Psychology, 6*, 368. <http://doi.org/10.3389/fpsyg.2015.00368>
- Kuniecki, M., Pilarczyk, J., & Wichary, S. (2015). The color red attracts attention in an emotional context. An ERP study. *Frontiers in Human Neuroscience, 9*, 212. <http://doi.org/10.3389/fnhum.2015.00212>
- Wiedemann, D., Burt, D. M., Hill, R. A., & Barton, R. A. (2015). Red clothing increases perceived dominance, aggression and anger. *Biology Letters, 11*(5), 20150166. <http://doi.org/10.1098/rsbl.2015.0166>.