Dress Color is in the Eye of the Beholder

By David Templeton, Pittsburgh Post-Gazette on 03.03.15

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PITTSBURGH — Controversy rages even if science can explain it. Is that dress on the Internet gold and white, or blue and black? Debates broke out in workplaces Thursday and Friday across the globe. Websites declared that the “Internet is losing its collective mind,” and “freaking out” and even “exploding” over the dress-color debate. It’s like arguing sweet or bitter, or hot or cold. Each person thinks the answer is obvious. The responsible party is a person with a Tumblr account who posted the photo online Wednesday, asking for help in determining whether a dress for a mother of the bride by Roman Originals, a small British fashion company, was indeed white and gold or blue and black. In actuality, the dress is blue and black. Out of 15 random people surveyed in downtown Pittsburgh on Friday, five saw the dress as white and gold. Kiel Conjack of Freeport, Pennsylvania, thought his wife was pranking him when she said she saw blue and black. “We got into a heated argument over this dress color,” he said. His wife then turned to the Internet and found a photo that proved the dress’s true color. It made him question his sanity. Reading, Pennsylvania, native Jeff Brown had the opposite experience. His fiancée believed the dress to be white and gold. He took up the blue and black banner, and it “felt good” to be eventually proven right, he said. Of 100 percent of people on Yahoo Tech online poll, 29 percent were male and 35 percent were female who thought the dress was gold and white. Only 14 percent male and 16 percent female thought it was blue and black. Six percent said it was something else. Everyone can relax. Science to the rescue. It could be a matter of some people thinking the gold-white dress is in the shadows with the blue-black crowd perceiving more ambient light. As such, the wrinkle in the dress controversy is the limited optical information the photograph provides the viewer, which forces the brain to use informed guesses as to what colors are being observed. Matthew A. Smith, an assistant professor of ophthalmology and neuroscience at the University of Pittsburgh, said people think our eyes take a photo and post it in the brain. That’s not the case. “Our brain takes information from the world through our eyes then uses context to try to figure out what’s going on,” he said, noting that he sees blue and brownish-black. “We don’t take a perfect photo. We have limited information and use context to figure out what’s going on.” When there’s ambiguity, the brain uses lifelong experiences to interpret the image, with people valuing cues in different ways. With the dress dominating the photo, there is limited detail available about the surrounding area, the light source, its intensity and whether the dress is illuminated or in the shadows. “What makes this photo compelling is how it is cropped around the dress so that it is missing context. So it is easy to be deceived,” said Smith, who holds a Ph.D. in neuroscience. “There are fewer cues, which means more guesses and the guesses can go either way.” John J. Guehl III, chief of the division of ophthalmology at West Penn Hospital, described it as an optical illusion of sorts. “We are bombarded by so many sensations that if you perceived all of them, you’d go nuts,” he said. The brain segmentally figures out the important parts and factors out and ignores the rest of it. It decides what’s the part that counts and makes changes on how it is perceiving the other parts.” One aural example is how a mother can ignore a roomful of noise, “but if the baby makes a peep, the mother hears it,” Guehl said. With limited detail, the brain must make informed adjustments about the quality of ambient light involved to decide what it is seeing. In that sense, some people might pay less attention to and filter out the blue background light, which makes the person see the dress as gold and white, he said. If the person filters out the white or yellow light, he or she will see blue and black. But Guehl said people in this region, based on context and experience, may view the dress differently than the rest of the world. “In Pittsburgh, everyone sees the dress as black and gold,” he said, referring to the colors of local sports teams. “Everyone else is all wrong. It’s clearly black and gold.”