Effects of Color in Eyewitness Vehicle Identification

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Abstract: This study examined the effect of the color of vehicles in eyewitness vehicle identification. This study aimed to test if vehicle color influences the accuracy of an eyewitness identification to correctly identify a vehicle. By changing the color of pictures of vehicles, the effect of the color in eyewitness vehicle identification can be examined. The participants were 265 college students. In two presentations given to two separate groups of participants, the participants were presented with a short slide show of vehicles, and asked to identify the color of a specified vehicle. Participants correctly identified the dull color slightly more than the participants who were asked to identify the bright color vehicle. Approximately 70% of those tested for white could identify the white car as white, and about 65% of those tested for red were able to identify the red car as red. However, this difference was nominal and cannot be regarded as absolute.

***Keywords**:* color, vehicle identification, eyewitness, forensic science

It has been described that memory is not a static system, that it is constantly changing. Bartlett showed that memories become more abbreviated, details are forgotten, and that later happenings can cause distortion of the memory (Bartlett 1932). Much attention has been focused on determining how eyewitness testimony can be influenced by the wording of questions, and in examining lineup identification. But little research has been focused on the eyewitness identification of vehicles, or other inanimate objects that may be connected to crimes.

Eyewitness identification has been touted by juries and judges to be both accurate and reliable, however, an increasing amount of research has been directed toward revealing the lack of credibility in eyewitness testimonies (Singh 2017). According to the Innocence Project, eyewitness misidentification is the largest contributing factor in wrongful convictions (Sainvil 2012). Given that memory is highly susceptible to errors, and due to the importance placed on memory in the courtroom, many studies have indicated the need for review of eyewitness testimony and the need to understand what affects the memory and accuracy of eyewitness testimonies. In addition to understanding the limits of eyewitness testimonies, several reforms of the use of these testimonies in court have been proposed (Albright 2017). In light of the heavy use of eyewitness identification and testimonies in courtrooms, the need to understand not only how it affects identification of people, but also the objects that pertain to the potential crimes as well.

A study was conducted in 2005 to determine how well vehicles could be identified by looking at two main features, color and type of vehicle (Villegas, Sharps, Satterthwaite, Chisholm 2005). Under ideal laboratory conditions, the study concluded that in only one-quarter of the trials the vehicle was correctly identified. This study was one of very few studies that researched in particular the accuracy of eyewitness testimony in vehicle identifications. Other studies looking at the reliability of identification of inanimate objects, also revealed a similar trend. In 2003, a study observing the reliability of the identification of firearms was conducted. Under excellent conditions, correct identification of handguns occurred just half of the time, while larger assault weapons were identified correctly three-quarters of the time (Sharps, Barber, Heather and Villegas 2003). This development was illustrated in the 2004 sniper case in Washington D.C., when eyewitness reports pointed the police toward a non-existent white van. Unfortunately, this was the only information the police had to go on, while the real vehicle was a dark blue Chevy Caprice (Blades 2005).

While these studies observed the participant's ability to recognize what they had seen previously, another study in 2014 evaluated the general knowledge about vehicles, and examined the accuracy of identification from eyewitnesses of different gender and level of expertise. This study concluded that certain brands of vehicles were more easily recognizable than others, and this was not necessarily related to high sales. Those with higher amounts of driving experience were found to perform better with higher accuracy than those with less. However, gender was not found to affect the results of the study (Allison, Overman, Braun and Campbell 2014).

These studies provided a baseline of what had been previously tested and researched in the field of eyewitness identification of vehicles and other inanimate objects. This study attempted to identify one aspect of identification of vehicles, namely how color affected the accuracy of an identification. A study by Park and Mason in 1982 tested the reliability of identification of color and location of objects in children and adults. They found that in both adults and children, their recall of placement of objects was better than chance, but the color of the objects was no better than chance. This indicates that memory of color was not an automatic process (Park and Mason 1982). However, in a different study on color recognition and memory performed in 1993, they found that color recall was well above chance, and that memory for colors can be good even when those colors had not been deliberately learned (Backman, Nilsson and Nouri 1993). These two studies illustrated the conflicting results in eyewitness identification on the accuracy of color identification. Because of these reports, this study aimed to identify if color affected the accuracy of the identification of vehicles.

Materials and Methods:

This study was performed with two groups of students from Texas A&M University. These groups were comprised of 131, and 134 students respectively. In total, 265 students volunteered to take part in this study, and were compensated with extra credit.

Both groups of participants viewed one video which displayed eight vehicles, each vehicle was shown individually for five seconds.

The vehicles in the video were stationary, with the same background, and same lighting. This was done so that the conditions of the vehicles and background of the picture would not make the vehicle more or less identifiable.

Each class viewed a different video, which was the same in every way, except for the color of one vehicle, a Ford truck. One video featured a red truck, while the second video showed a white truck. The other vehicles in the presentation were of different colors and types of vehicles. The video was shown before class, and after 20-30 minutes of lecture, a question was presented to the class to identify the color of the Ford truck. The question was presented as a fill-in question, and was taken via an application on a mobile device.

Results: After each group was done answering the question, the computer program tallied the results, grouping each like answer together. The results were tallied in **Table 1.** The first group of participants viewed the presentation identifying the white truck.

Table 1: Identification of White Vehicle

Color:	Percent:	Total number of votes:
White	69.5%	91
Blue	12.2%	16
Red	5.3%	7
Black	3.1%	4
Silver	1.5%	2
Brown	0.8%	1
Not applicable response	7.6%	10
Total:	100.0%	131

In the first group of 131 students, 91 participants reported the color as white, while 30 students reported the color as blue, red, black, silver, and brown in that order, and 10 students wrote a not applicable answer.

The second group was asked to identify the color of the red truck, and the results were tallied in **Table 2.** In this test, 86 students identified the correct color, while 37 students reported the color as blue, orange, black, and white in that order. While 11 participants wrote not applicable answers.

Table 2: Identification of Red Vehicle

Color:	Percent:	Total number of votes:
Red	64.2%	86
Blue	22.4%	30
Orange	3.0%	4
Black	1.5%	2
White	0.7%	1
Not applicable response	8.2%	11
Totals:	100.0%	134

Discussion:

The hypothesis of this study was that brighter colors are more readily recognized and more memorable. This would be indicated by participants in the second trial significantly reporting the correct color, as opposed to the first trial. Based on the two trial results for potential influence of vehicle color on the accuracy in identification of vehicles, color did not affect the accuracy of identification. Although several previous studies had low correct identifications, this study was purely reviewing the accuracy of color identification. As previously mentioned, how color is recognized and if it is an automatic process is contested in several research studies. The results of this study were far better than chance results, and this may indicate that color is automatically recognized. It must also be recognized that the circumstances surrounding the experiment, i.e. the fact that those being tested were being rewarded for participation alone, and not the ability to correctly identify the color of the car, could lead to responses that are not truthful, seeing as how the medium of conveyed information is a survey that is not monitored. However, more research in this area may be warranted to further analyze in depth how color is remembered and how it can affect the accuracy of eyewitness testimonies.

What is not taken into account from this experiment is that the measurement used (pictures shown and having color reported later) does not take into account the idea of color being made of many components, so much so to the point that what we know as “color” is purely subjective in nature, and cannot be determined as true, or false, without performing a color test that is objective to include value, chroma, and hue, which would invariably determine the exact color of the trucks presented (McGuire 1992). This experiment also does not factor in the circumstances of the potential for additional pressure/stress and greater gaps in time for reporting information that is typical of most eyewitness testimonies. Further testing that can find ways to be more objective, as well as more correlated with the common circumstances surrounding eyewitness testimonies would be more likely to yield more accurate and significant results.

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