Crosswalks:

To use the flag or not to use the flag?

Social Psychology 3020-070

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Introduction

The purpose of this study was to determine whether or not using an orange pedestrian flag influenced the rate at which cars stopped for pedestrians to use the crosswalk. Our hypothesis was that using the orange pedestrian flags will increase the rate at which vehicles stop because their florescent color serves as an attention getter to drivers.

This topic was chosen because as college students on a large commuter campus, we feel that pedestrian safety is important. Pedestrians hit by vehicles are often seriously injured and pedestrians have the highest ratio of deaths to injuries in motor vehicle accidents (DeVeauuse, Kim, Peek-Asa, MacArthur, & Kraus, 1999). According the Environmental Working Group, approximately 41 pedestrians are killed each year in Utah (2006). The Environmental Working Group also reports that an estimated 830 pedestrians are injured each year in Utah (2006). These numbers gave us reason to research this topic and try to find factors that can help decrease this problem.

Relevant research on this topic was related to the factors influencing cautiousness in pedestrians while crossing streets. A study done by Harrell (1990) determined that female and older pedestrians were more cautious when crossing streets. Pedestrians were also more cautious when outside temperatures were warmer or when crosswalks were icier (Harrell, 1990). Width of the crosswalk (e.g. number of lanes), and time of day did not seem to affect cautiousness of pedestrians (Harrell, 1990). An interesting finding of this study is that pedestrians were less cautious when there were a lot of people in the crosswalk. The author hypothesized that this may be due to the concepts of “diffusion of responsibility” and “safety in numbers” (Harrell, 1990). Diffusion of responsibility is the idea that pedestrians may diffuse the responsibility of cautiousness to the other people crossing the street with them. Safety in numbers is a basic

concept. It refers to the idea that people feel safer in bigger groups and may feel that cars will stop for them if they are traveling in a large group (Harrell, 1990).

Another study was done relevant to Utah statistics of pedestrian deaths and dangerous intersections. The study done by Cottrell & Mu over a ten year period, provided much useful information. The operational definition of an intersection in this study was, "A crossing or meeting of two or more roads, at grade. An intersection may be controlled by a traffic signal, stop signs or yield signs, or it may be uncontrolled" (Cottrell & Mu, 2005, P.12). This definition is important because pedestrians are typically hit at or near an intersection. This study identified many reasons why collisions or crashes occur. Some of the major reasons identified relevant to pedestrian safety are vehicles turning right on a red light, pedestrians crossing the street outside the assigned crosswalk, having a bus stop near an intersection, pedestrian jaywalking, and heavy pedestrian volumes (Cottrell & Mu, 2005). Some secondary factors related to this are if crosswalks, lines for lanes, and stop signs are mot clearly marked or visible and if there is no designated pedestrian crosswalk or walk/do not walk signal (Cottrell & Mu, 2005). This study was conducted in Utah using statistics from the Utah Department of Transportation (UDOT). This study found that the intersection with the highest number of crashes in Utah between 1994 and 2003 was the crossroads of Bangerter Highway and 5400 South in Taylorsville (Cottrell & Mu, 2005). This intersection had 949 collisions recorded in the time period, which averages out to about 95 per year (Cottrell & Mu, 2005). Amazingly, only one collision was fatal in the ten year period (Cottrell & Mu, 2005). The second and third most dangerous intersections on the list of highest amount of crashes were also located in Taylorsville. Number two is the intersection of Redwood Road and 5400 South with 914 crashes, and number three is the intersection of Redwood Road and 4700 South with 835 crashes over the ten year period (Cottrell & Mu, 2005).

This study was significant because it is important for pedestrians to know which intersections are the most dangerous in this state so they can avoid these intersections or exercise extra caution when approaching the crosswalks near these areas.

A study done by DeVeauuse, Kim, Peek-Asa, MacArthur, & Kraus investigated the compliance rates of vehicles in regard to pedestrian crosswalks on a university campus (1999). This study was done at UCLA, using three busy sites on the campus for observations. This study is comparable to the University of Utah because it is also a large commuter campus with an estimated daytime population of over 50,000 people (DeVeauuse, Kim, Peek-Asa, MacArthur, & Kraus, 1999). This study found that the overall compliance rate of vehicles stopping at a stop sign was 22.8 per 100 vehicles (DeVeauuse, Kim, Peek-Asa, MacArthur, & Kraus, 1999). In this study, a complete stop meant "the tires of the vehicle stopped rotating with the majority (two-thirds or more) of the vehicle remaining behind the marked stop line" (DeVeauuse, Kim, Peek-Asa, MacArthur, & Kraus, 1999, P.3). The findings of this study are important because the data can be used to show that universities need to implement a safety program for drivers on their campuses to keep the many pedestrians safe.

An important law pertaining to pedestrians in Utah is State Law 41-6-78. This law states that, "A vehicle shall yield to a pedestrian in a crosswalk when the pedestrian is on or is approaching the half of the roadway which the vehicle is traveling" (Department of Public Safety, 2004). This law was last amended in 1992 and pertains to the whole state of Utah.

Methods

As previously stated, the goal of our study was to determine whether or not using orange pedestrian flags while crossing a marked crosswalk would influence how many cars stopped for pedestrians in said crosswalks. Based on that goal, our hypothesis was that using the orange

pedestrian flags would increase the number of vehicles that stopped because their florescent color serves to attract the attention of drivers.

For our experiment, we chose a busy intersection in the “Avenues” in Salt Lake City to conduct our research. The observation was set up at the crossroads of “I” Street and 2nd Avenue in Salt Lake City, Utah. A hidden camera was used to document results to be analyzed after the experiment was done. In each trial of the experiment, two individuals were crossing the street at opposite crosswalks. The area chosen is a residential neighborhood that feeds into a business district. This area is zoned to accommodate several schools and churches. This setup allowed for a good amount of traffic flow during the experiment. Both crosswalks used were on streets without stop signs or traffic signals at the intersection, which allowed the vehicles to travel at a higher rate of speed.

The experiment was conducted on a cloudy, rainy day. Observations were taken over a span of about two hours. The first forty five minutes of filming was spent observing the volume of traffic passing through the area. This was followed by thirty minutes of observing the effects of pedestrians crossing without orange flags. During this time there were two individuals crossing at the same time. For example, one individual would cross the street heading east on the north side of the intersection while another individual would cross the street heading west on the south side of the intersection. There was one individual in each crosswalk, a male in one and a female in the other. Following this, thirty minutes were spent with two individuals crossing with the fluorescent flags, one female in each crosswalk. Due to the heavy volume of traffic, we accumulated a substantial sample to base our findings on.

Results

In the experiment, a total of 300 cars passed through the intersection. Of the 300 cars, 180 fit into the category of cars to first approach the intersection. These were the cars that were recorded as either “stopping” or “not stopping.” The other 120 cars were either cars that were behind the stopped car or were passing through the intersection when no one was waiting to cross the crosswalk. These cars were not included in the “stopping or not stopping” category because they were not influenced by the orange flags. This was evident with a vehicle that honked the horn at a stopping car because the driver did not realize that the car in front of it was stopping to allow a pedestrian to cross.

Raw data gathered from the observation video yielded that when orange flags were used, 75 vehicles stopped to allow the pedestrian to cross, while 17 vehicles did not stop. When the orange flags were not used, 18 vehicles stopped and 70 vehicles did not stop. After analyzing the raw data gathered from observations, we found that 81% of vehicles stopped for the pedestrian to cross the street when the pedestrian was holding the orange flag. When the pedestrian did not use the orange flag to cross the street, only 20% of vehicles stopped.

Once the data was analyzed, we found that the experiment confirmed our hypothesis. The large difference between the groups of “flag” or “no flag” was substantial enough to conclude that our hypothesis fit the data collected. Once again, the percentage of people that stopped for the pedestrians when using the orange flag was 81% and the percentage of people that stopped for the pedestrians when the orange flag was not in use was 20%. Although these results cannot prove that orange flags are the sole reason vehicles stop for pedestrians, we feel that there is a strong enough correlation to conclude that our hypothesis is correct.

Discussion and Limitations

When analyzing the data one is able to conclude that using a flag to cross the street is more effective. The results are strong in illustrating that people stop more frequently when an orange flag is used. When analyzing the results, we wanted to look into why drivers stopped more frequently when a flag was used. When beginning to answer this question we first tried to see if the drivers were reacting to external stimulus or internal stimulus. There are many internal stimuli that the drivers could have been responding to. They could have been thinking about something going on in their life, looking at the stop light at the end of the street, or could have been focused on what was on the radio. These distractions could be reasons why drivers did not stop when there was a pedestrian attempting to cross the street. There could have been other external stimuli that the drivers were affected by. They could have been affected by other cars on the road, other individuals in the car, or picking a radio station. The above are only a sample of factors that could have gone into why drivers stopped or did not stop for the pedestrian.

To determine that our hypothesis was correct, we used Kelley's casual attribution theory. As part of this theory, we first focused on the three major types of information. We looked at the consensus, consistency, and distinctiveness of the experiment. The consensus was strong. The majority of the people stopped when there was a flag and the majority of the people did not stop with the absence of the flag. The consistency was high as well. In many different variations and different approaches the result was the same. The pedestrians crossing the road went on different sides of the street, had different people cross, and attempted to cross at times when the cars were still far from the crosswalk, and when they were closer to the crosswalk. With all the variations the results were similar, which means that the consistency was high. Distinctiveness was unable to be determined because the police officer contacted was unable to come. This

limitation could have helped to conclude that another external stimulus affected drivers. If other external stimulation were able to be used, we would have had a better analysis of the distinctiveness of the drivers. Within our predictions and the results from past studies we concluded that the distinctiveness would have been high.

One major sociological principle that the experiment was based on was Symbolic Interactionism. Symbolic interactionists feel that individuals react to signs and symbols, and that causes most behavior. We found this perspective to be true in the flag experiment. Drivers are used to reacting to symbols on the road and their choices are based on the meaning they see in the signs and symbols. They respond to street signs, stop lights, and follow certain rules when they are driving. Speed is determined with what the street sign is or what kind of geographic area they are in. For instance, when someone is in a neighborhood they usually drive 25 miles per hour, even if there is no posted speed limit sign. People also tend to drive 65 miles per hour when they are on a freeway or highway. In the task of driving, people react to the signs and symbols of the road usually sub-consciously, requiring little attention. When a pedestrian is at a crosswalk and does not have a flag the drivers are more likely to keep driving through the intersection because there is no symbol or sign to react to. When the driver sees an orange flag they then start to slow down automatically and are more likely to stop for the pedestrian. We feel the orange color grabs the attention of the driver, and then they interpret the color to mean "stop to allow the pedestrian to cross." We feel that our hypothesis was found to be correct because of symbolic interactionism. We found this to be true because the majority of drivers interpreting the orange flag to mean that they must stop for the waiting pedestrian.

Due to the limited amount of time and resources, this experiment had many limitations. Limited time was responsible for small amounts of research conducted on previous studies and

theories. Another limitation of the experiment was that the original design of the study included a police officer parked near the intersection to see if he/she would have an influence on driver's behavior. This limited us from gathering enough data to test the distinctiveness in Kelley's casual attribution theory. Future studies could add this element into the design of the study to see if the police officer acts as an external stimulus. Another limitation was that observations were the only method of data collection used. Drivers were unable to be contacted; therefore in depth interviews were not conducted. Future studies could interview drivers about the stimulus they are affected by, including if the orange flag influenced them or not. The interviews could determine whether drivers respond more to internal stimuli or external stimuli. Another limitation was that we did not have sufficient funds to conduct a thorough experiment and research project. Had we had the funds we could have studied more than one location, hired a police officer, and had the correct research tools to analyze the data. We could have possibly done a historical comparative research project where we compared our findings with past studies with similar research questions.

The future direction of the research in the same area of interest is likely answer more reasons why people either stop or do not stop for pedestrians. By interviewing or conducting a survey of the drivers in future experiments, future researchers will be able to know if the drivers are simply adhering to the driving rules of the road or reacting to other stimuli. Another interesting aspect future research could address is why driver's tend to stop more for the orange flags. It could be researched whether or not stopping is due to the fluorescent orange colors of the flags, the fact that stopping for pedestrians is a law, or if people merely feel that they should stop to allow pedestrians to stop.

Conclusion

The purpose of this study was to determine if using an orange pedestrian flag would influence cars to stop to allow the pedestrian to cross. Previous research on similar topics was related to factors influencing pedestrian cautiousness, dangerous intersections in Utah, and compliance rates of vehicles approaching a stop sign at a large commuter campus similar to the University of Utah. The methods of the experiment were carefully explained so future research could replicate the study. Results found that 81% of vehicles stopped to allow pedestrians to cross when they were holding the orange flags, while 20% of vehicles stopped when orange flags were not used. We found our hypothesis to be correct because of the great difference of drivers that stopped when orange flags were used compared to when they were not used. We also used Kelly's causal attribution theory and symbolic interactionism to determine our hypothesis to be correct.