Crosswalk patrol: Encouraging safer use of crosswalks

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Executive Summary

In an effort to prevent and reduce accidents that might happen within the campus of the University of British Columbia, our research was interested in what kind of interventions could be put into place to increase safe pedestrian behaviour involving the use of crosswalks. Using an observational study design, we investigated whether the presence of a visual prompt (road sign) or manipulating the feeling of being monitored on their behaviour would increase safe or unsafe crosswalk usage by pedestrians. We hypothesized the following: 1. The presence of only the visual cue would result in no significant difference from control, and 2. When pedestrians feel like they are being monitored, they are more likely to use the crosswalk safely. Our results supported both of our hypotheses. Our main finding was that individuals are more likely to use the crosswalk safely when there was one person wearing a safety vest and holding up a sign that encouraged safe crosswalk behaviour. Our results further revealed that having more than one person with a sign does not significantly increase safe crosswalk behavior, but it did reduce the number of people engaging in unsafe crosswalk behaviour than displaying the sign alone. We discuss the implications of this study with regards to suggestions for creating a safer environment for pedestrians and to reduce unsafe road crossing behaviours.

Introduction

The University of British Columbia attracts many students and employees from all over the world and based on initial observations, it is a typical sight to see people walking all over campus whilst disregarding traffic and pedestrian crossing regulations. Unfortunately, accidents are bound to happen when pedestrians do not follow the correct traffic protocols, and choose instead to engage in behaviours such as jaywalking, failing to use the crosswalks correctly by not pressing the pedestrian crosswalk button, not waiting for the light to change, and many other unsafe ways of crossing busy roads.

In this experiment, we wanted to observe whether people used the crosswalks safely or unsafely when they noticed a visual cue. We were also interested to see if people felt the social pressure to use crosswalks safely if they felt like they were being monitored on their behavior by others. As suggested by previous research, humans are likely to be sensitive to social cues and tend to behave better when they are under the gaze of watchful eyes (Asch, 1956). Specifically, when individuals witness groups of people performing a certain behaviour, they are more likely to follow along and conform because they do not want to be judged negatively by others. In the case of our experiment, it is probable that people will engage in safe crosswalk usage when they feel like they are being judged by others for their actions. It follows that our hypothesis predicted that when people are under the impression that their behavior is being monitored, they are more likely to use the crosswalk safely. Moreover, warning signs are less likely to be effective in changing behaviour when they are perceived as unnecessary, and will not encourage an individual to be more cautious in potentially dangerous situations (Wilde, 2014). When one notices a danger sign, they are unlikely to recognize it's importance if they do not assess it as a threat. Thus, we also hypothesized that in the presence of only the visual cue, when the feeling of being monitored on their behaviour was absent, the results will not show any significant changes compared to the control condition.

Methods

Participants

A total of 200 people were tallied each day from Monday to Thursday in the week of March 14th – 17th, 2016. All together, there were 800 participants in our observational analysis. We chose to record data from 200 participants because the pedestrian traffic density and the time on the days of observation allowed us to collect this data with minimal issues. We wanted to avoid certain issues that we predicted might occur before beginning our data collection, which included recording data from the same participant more than once within the time period of data collection, (in the event that they used the crosswalk more than once while we were observing), and we also wanted to choose a number of participants that we could collect data from within the periods of time that our researchers were available for. Within these boundaries, we decided that 200 participants per condition would give us a representative sample of the day-to-day use of the crosswalk and was a feasible number to accomplish for each condition. The participants in our study were probably students and faculty members however, since this was an observational experiment, we could not be sure of this fact as we did not formally survey their occupational statuses.

Materials

We used a sign, safety vests and a tally sheet in this study (please see Appendix C,D and G respectively). The tally sheet used in all four conditions had the same structure and content; it included the researcher's names, the date, the weather, and which condition we were collecting data for. We recorded our observations by taking a tally of the population that used the crosswalk safely or unsafely. The sign was a black foam board with a neon yellow

cut-out of the road sign message on both sides. The dimensions of the sign were 20'' x 30'' (50cm x 76cm). Descriptive normative information was provided on the sign and it read "Be safe", "Please use crosswalk". A descriptive norm is a behavioral rule that individuals follow when their empirical expectations of others following the same rule are met, and this applies to road and safety signs because we expect people to follow guidelines that are placed in the world (Hartmann et al. 2014). An image of a man using the crosswalk was also displayed on the sign. The purpose of the sign was to direct the pedestrian's attention towards using the crosswalk safely. Researchers used clipboards in all conditions and wore safety vests in conditions 3 and 4.

Conditions

We conducted a study with four conditions. The first condition was the control condition, where two researchers were located in an inconspicuous location and they watched pedestrians and tallied how many people used the crosswalk safely and unsafely (please see Appendix F and E for our area of observation). In the second condition, we attached a double – sided sign with the message "Be Safe, Please Use Crosswalk!" and displayed it by attaching it to a pole that was located at the midpoint of our observational area, which was on a grassy island separating the opposing sides of traffic. Two researchers recorded the number of people using the crosswalk safely or unsafely from an inconspicuous location. In our third condition, one of the researchers wore a safety vest and held the double-sided sign while the other researcher tallied safe and unsafe use of the crosswalk from an inconspicuous location. Lastly, our fourth condition had two researchers wearing traffic vests, one with a clipboard and tallying and other other holding up the sign. Because we strived to acquire data on days with a high amount of road usage, all of our observations were recorded from 12pm - 2pm on a weekday.

Procedures

The location of our research was at a pedestrian controlled crosswalk at Wesbrook Mall in University of British Columbia (please see Appendix B and E). There were three reasons as to why we chose this crosswalk in particular; 1. it is pedestrian controlled, so we could observe whether or not pedestrians were intentionally using the crosswalk safely or not, 2. it is located in an area that has a high amount of traffic on a daily basis, and 3. it is close to the bus stop. Four researchers contributed to this study and each condition required two researchers to participate. We picked four weekdays in March (March 14th, March 15th, March 16th, and March 17th) for observing each of the four conditions. These days were chosen so that two researchers could be present at each of our conditions. The researchers ran each condition at the same time of the day between 12pm to 2pm. We chose this time during the weekdays because within this time frame, we could control certain variables, such as decreasing the number of intoxicated participants and also carrying out our observations during a time of busy pedestrian traffic. In addition, given the availabilities of our researchers, as well as the time given to us to carry out this experiment, this particular time span was optimal. Pressing the button, waiting for the light to change, and crossing within the designated area were behaviours that were considered to be safe crosswalk usage. Those who did not press the button, wait for the light, and jaywalked outside of the designated area were deemed as unsafe crosswalk users. We recorded our observations according to these boundaries of safe versus unsafe crosswalk use by tallying how many people performed these behaviours on our tally sheet. After 200 participants were tallied, we calculated the number of people out of 200 who used the crosswalk safely or unsafely. Depending on the weather and other factors such as visibility, the time it took for us to collect data from 200 participants varied between 30 minutes to 90 minutes.

Results

To interpret the results of our observational study, we ran a chi-square analysis in SPSS which yielded the following results. Results for the general chi-square were significant ($\chi^3_{(1,1)} = 23.07$, $p = .000$). This indicates that our conditions were able to influence safe behaviours at the crosswalk. This statistic alone is not in-depth enough as it does not tell us which conditions were significant and which were not. To understand these details, we ran the tests again, this time comparing each condition against the other to be sure of which conditions were significant in regards to the others (please see Appendix A). Our results from running multiple Chi-Square tests revealed that the most significant (effective) condition was condition 3 (one researcher wearing a safety vest and holding the sign) being significant in every category ($\chi^1_{(1,1)} = 18.85$, $p = .000$), ($\chi^1_{(1,1)} = 16.14$, $p = .000$) and ($\chi^1_{(1,1)} = 5.99$, $p = .014$). A marginal significance was seen for condition 4 (two researchers wearing safety vests where one researcher was holding the sign and the other was tallying), ($\chi^1_{(1,1)} = 3.90$, $p = .048$) when compared to the control condition. There was no significant change in safety patterns for condition 2, sign only, ($\chi^1_{(1,1)} = .145$, $p = .703$) and there was no significant difference between condition 2 and condition 4. ($\chi^1_{(1,1)} = 2.61$, $p = .106$).

Discussion

Our results suggest that the presence of people with the job of observing pedestrians or encouraging safer use of crosswalks at a crosswalk can actually encourage safer behavior and this finding supports our first hypothesis. Both of our conditions involving researchers showed significant results and increased safe behavior. Interestingly it was observed that the presence of only one researcher along with the sign (condition 3), yielded the greatest number of pedestrians engaging in safe crosswalk behaviour, and had a higher significance level than when there were two researchers and the sign (condition 4). We can only speculate as to why this may have occurred; one possibility is that when the researcher was alone, they portrayed more of a professional impression than when there were two researchers sanding within close proximity of one another. There was no significant difference between our control condition and just having the sign hanging on its own (condition 2), and this result supported our second hypothesis, where we predicted that no significant change in safety behavior would occur when people were exposed to a visual cue alone compared to control.

A limitation of our study was that we had to set a cut off point in our area of observation for jaywalking to make it feasible for keeping our tally. The number of participants that we observed in each condition could have been higher, which may have revealed different significant results if we had broadened our cut off point.Weather was a possible confounding factor in our study; the weather could have affected the visibility of our sign on windy and cloudy days making it harder to notice, and may have affected the behaviour of our participants. In addition, when the weather was bad, people seemed to want to take the route that would be the fastest, and not necessarily the safest. This may have been because people wanted to spend less time outside in the bad weather and reach their indoor destination faster. Furthermore, visibility was also affected when the bus stopped between our participants and our sign so they could not see the sign at all until they were at the crosswalk or already jaywalking. Pedestrians at the furthest points of our observational area may also have not have been able to see our sign clearly. Our study was fairly limited as to what we could do for our conditions as we had to be careful not to be a disruption to traffic or do anything that would distract drivers; this kept us from being able to implement anything that may have been a more powerful deterrent to jaywalking, such as using a loudspeaker or a horn to call jaywalkers out. We also assumed that participants noticed the sign and the

researchers wearing the safety vests when they were present, and that they did not notice the researchers who was positioned in the inconspicuous location.

Recommendations for our client

We have several recommendations for our client. We noticed that the highest density of jaywalking traffic occurred in two main areas within our area of observation; in front of the entry point for cars into the UBC hospital and whenever busses that stopped at the bus stops near the crosswalk stopped a bit too far away, and people tended to cross the road and the grassy islands diagonally out of convenience rather than walk back to use the crosswalk. Firstly, if there were plans to instal a new crosswalk within the area that we observed, we believe that the position in front of UBC Hospital would be optimal to protect the people who tend to jaywalk there. We believe that in front of the UBC hospital would be a good location for such a crosswalk because of the high density of people who already jaywalk across at that location. If there was a crosswalk there, it would make it much safer for the pedestrians. If not, perhaps positioning a person wearing a safety vest and holding the sign in that area would encourage people to use the nearby crosswalk, as suggested by the results of our study. Secondly, bus drivers could be notified to stop closer to the crosswalk so that people do not have to walk as far to use the crosswalk. Although we are aware that bus drivers have little control over where they are permitted to stop once the bus stop is placed, we think that an increase in communication between transit systems and urban-planning systems when it comes to deciding on the location of future bus stops. The results of these decisions could be very important when it comes to encouraging safer crosswalk behaviours by pedestrians. Thirdly, another intervention that could be implemented is to mention the monetary fine of jaywalking, which is that across Canada, an individual could be fined anywhere from 15CAD to 700CAD for jaywalking (Torstar News Service, 2015). We are under the impression that most people are unaware of how expensive those fines can get, and if this information was made more salient, perhaps people would be less willing to jaywalk out of convenience, and due to the fear of owing a great deal of money. If there were signs that included the potential price of jaywalking placed in areas of high density of unsafe crosswalk behavior, it could cut down on the number of people who risk unsafe behaviors merely to save time. Finally, since people seem to jaywalk out of convenience, a possible solution could be to implement something that would inconvenience people. Low fences surrounding the grassy islands, or some other kind of deterrent could be put into place to inconvenience the jaywalkers to the extent that they would rather use the crosswalk than not.

References

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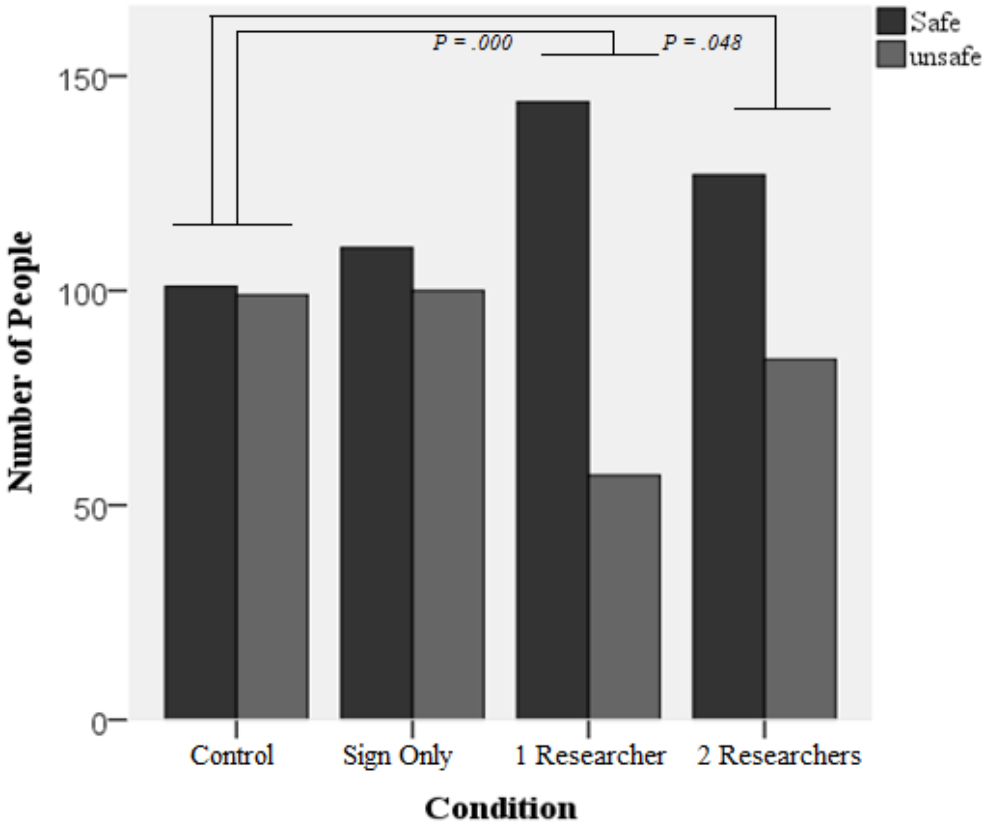
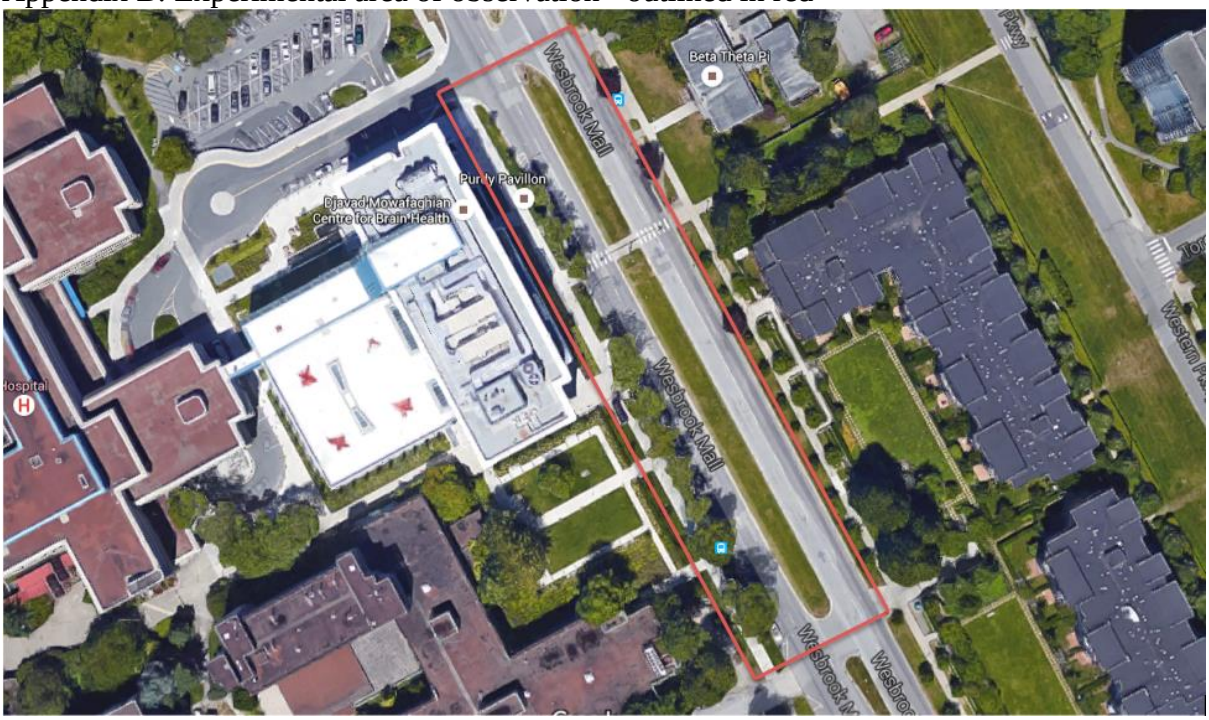
Appendix

Appendix A: Results chart

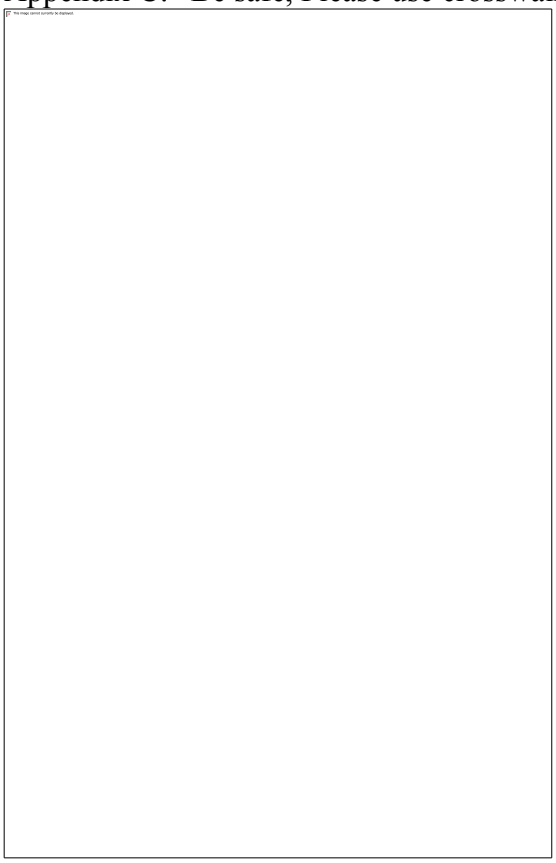


This bar graph shows the comparison of the amount of people that use a cross-walk safely against people who cross unsafely. The Y-axis represents the number of people that were measured each day, the X-axis represents the condition that they were observed in. The black bar indicates safe behavior and the grey bar indicates unsafe behavior. The results showed a significant difference between conditions ($\chi^3_{(1,1)} = 23.07$, $p = .000$).

Appendix B: Experimental area of observation - outlined in red

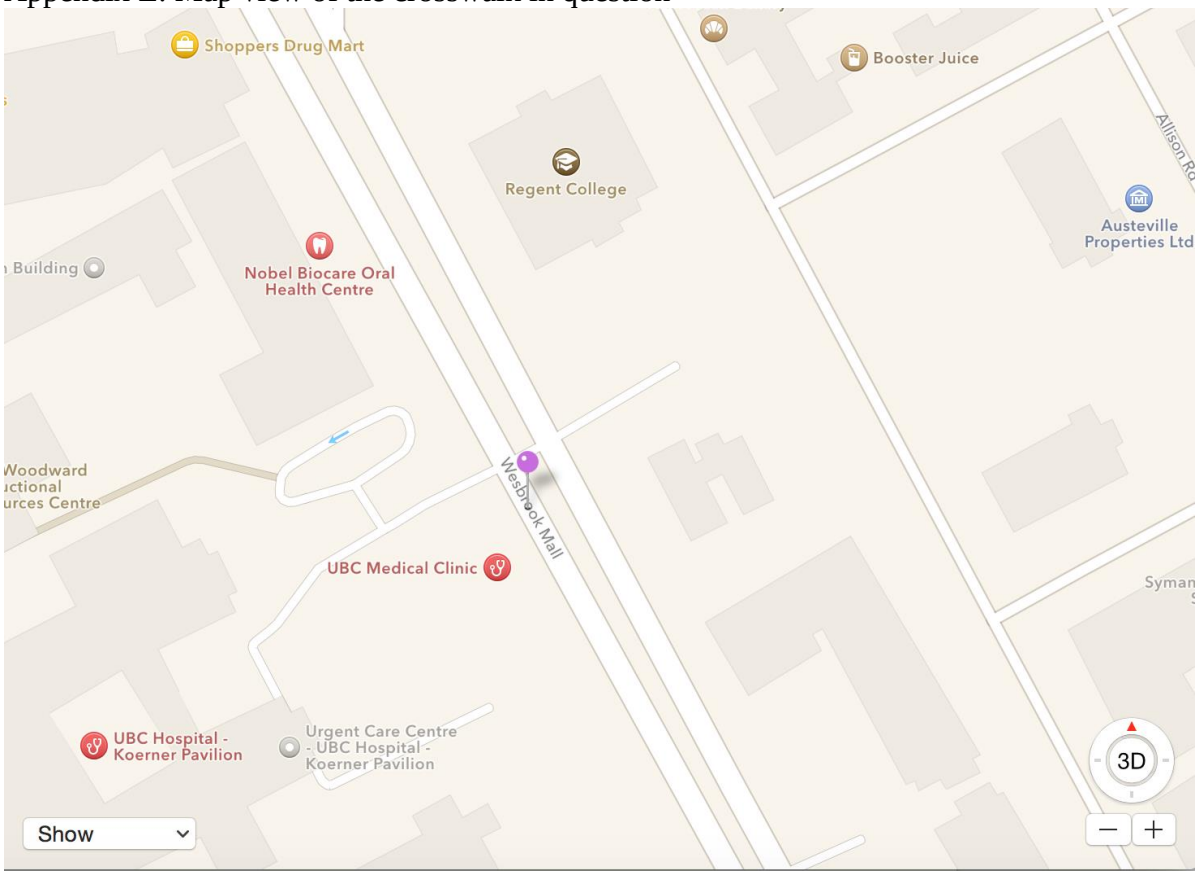


Appendix C: “Be safe, Please use crosswalk” sign.



Appendix D: Safety vests used in conditions 3 and 4

Appendix E: Map view of the crosswalk in question



Appendix F: Street view of the crosswalk in question

Appendix G: Tally sheet

Researchers:
Date: **Time:** 12:00PM - 2:00PM **Weather:**
Condition:

	Number of people
Safe use of crosswalk (press button, wait for light, and watch for cars)	/100
Unsafe use of crosswalk (people who do not press button, wait for the light, or jaywalkers)	/100

Total number of people: 200