URBAN CYCLING SAFETY: INDIVIDUAL OR SOCIAL RESPONSIBILITY?

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INTRODUCTION

In the summer of 2000, a survey was administered in downtown Toronto, Ontario, that tested attitudes toward two approaches to urban cycling safety. The first is the *individual responsibility model* distinguished by its focus on cycling as an individual choice and safety as an individual responsibility. The underlying philosophy is straightforward—to achieve equal status bicycles must be treated exactly the same as motor vehicles and this should be the aim of policy development and cycling practice.

The second approach is the *social responsibility model* in which cycling is determined by social and physical conditions and safety is a social responsibility. This approach relies on the belief that a single principle of equality is insufficient for transportation modes with vastly different characteristics. Instead each mode is considered and designed for specifically and the least dangerous and most beneficial modes (walking and cycling) are given preferential treatment. Of particular interest in this study was whether base support exists for the social responsibility model that would then warrant the enacting of policies to move us beyond a strictly individualistic approach to cycling safety.

Why are North American transportational cyclists more likely to be white and male?

This survey also gauged the barriers to cycling for women and visible minorities and the characteristics of those who would like to cycle more than they currently do. An overriding goal of this study was to come to a better understanding of why it is that transportational cyclists in North America are more likely to be white and male. There is virtually no literature exploring why it is predominantly whites in North America who voluntarily cycle (as opposed to those who cycle out of fiscal necessity). This study showed that women and visible minorities have more barriers to cycling than white men, and analysis was conducted to determine why this is.

METHODOLOGY

As this was an unfunded study, a random sample was impossible so a nonprobability sampling technique (convenience sample) was used. This method is considered appropriate for a study examining relationships between variables but is limited in the extent to which the results can be generalized.

In the summer of 2000, the survey was administered to a total of 188 people at five different times. The majority of respondents were members of the public accessing libraries at two downtown universities. Of the 188 completed surveys, 8 were spoiled so 180 were included in the final data set.

SURVEY DESIGN

The survey was designed to attain information in two general areas: 1) Attitudes toward two individual and social cycling barriers: 9 multiple choice items on a 4-point Likert scale; and 2) Attitudes toward individual and social cycling solutions: 6 multiple choice items on a 4-point Likert scale. The wording of several of the survey questions duplicated those from a survey administered by the City of Toronto (Decima, 2000) for comparison purposes with a large-scale random data set, thus increasing the confidence level of the findings of this study.

1. Attitudes Toward Individual and Social Cycling Barriers

There were nine potential cycling barriers that respondents indicated their level of agreement with. Six barriers were categorized as individual: 1) passengers/heavy loads; 2) health/fitness problems; 3) not having friends/family who cycle; 4) no bike; 5) importance of appearance; and 6) don't like cycling. Three were considered

to be more social: 1) amount and speed of motor vehicle traffic; 2) weather not conducive; and 3) living too far from most places needing to go. There was much less overall agreement regarding individual concerns about cycling (20% overall agreement) than social concerns (48% overall agreement).

The most significant finding was that only one of the nine barriers, regarding the amount and speed of motor vehicle traffic, was of concern for the majority of respondents (76%). That this is the only item of real concern to respondents is sadly ironic as it lies outside the scope of what is generally considered bicycle planning. The data revealed some interesting clues into the impact that barriers to cycle might have on willingness to cycle, especially in terms of differences between men and women and between white and visible minority respondents.

1.1 Sex Differences in Willingness to Cycle and Barriers to Cycling

This survey confirmed that sex differences in cycling exist. Of the 115 respondents who would like to cycle or cycle more, 52 were women (58% of all females surveyed) and 63 were men (71% of male respondents.) So for the primary question of whether or not a relationship exists between willingness to cycle and sex, the correlation coefficient ($r=-.1534$, $n=177$, $p<.05$) shows that male respondents, significantly more than female, were interested in cycling. However, lack of interest does not tell the whole story about why women cycle less. The barriers to cycling provide some clues.

Every barrier but one (not having family or friends that cycle), was identified by a greater percentage of women than men as an issue of concern. The most significant barrier for both men and women was the amount and speed of motor vehicle traffic. 82% of women and 69% of men agreed this was a significant concern. The presence of barriers impact on men and women differently. They seem to decrease women's interest in cycling more than they do for men.

Figure 1. Relationship Between Cycling Interest and Barriers to Cycling for Male and Female Respondents

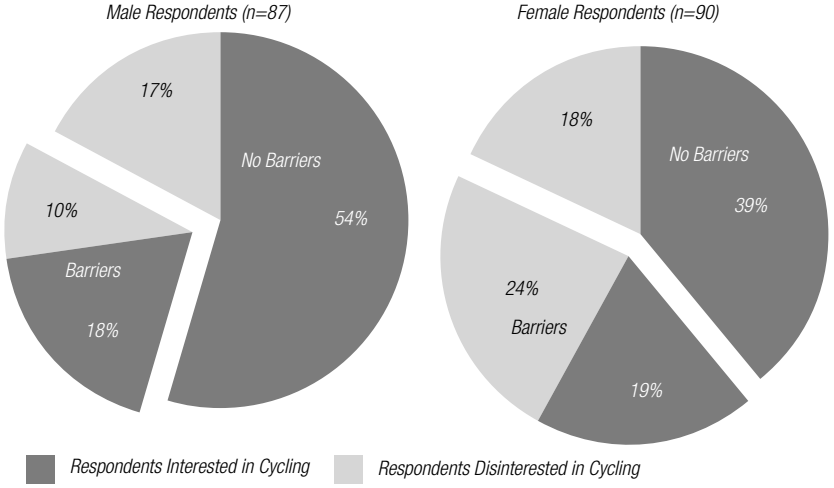


Figure 1 show differences between men and women in terms of the relationship between cycling barriers and interest in cycling. Two of the four quadrants in the pie charts are of particular interest. The first is the quadrant which shows that there is a much higher percentage of male respondents (54%) than female (39%) who are in the "no barriers" category and are interested in cycling.

The other quadrant in which a significant difference is found is for those who identified barriers and were NOT interested in cycling more than they do. This describes nearly a quarter of the women (24%) yet only 10% of the male respondents. So male respondents expressed fewer barriers to cycling than female respondents did. Furthermore, the presence of barriers has a greater impact on women's cycling interest than on men's.

Even those who cycle experience barriers to cycling in terms of how stressful they consider the traffic environment. Respondents who were cyclists were asked to indicate which cycling facilities they felt comfortable riding on, a question asked originally of Decima (2000) survey respondents. The Decima survey found that "among cyclists who are comfortable cycling on major roads without bike lanes, seven in ten (70%) are men…" (Decima, 2000: 18). This study replicated that finding. Only 53 of the 133 cyclists (40%) were comfortable cycling in this type of environment and 68% of those were men.

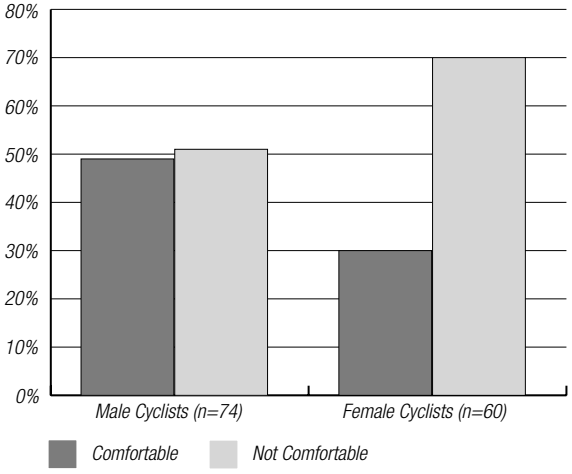
Only one barrier — the amount and speed of motor vehicle traffic — concerned most respondents. It is sadly ironic that this lies outside the scope of what is generally considered bicycle planning.

White respondents were more interested in cycling than visible minorities.

Even so, less than half of the male cyclists (49%) are comfortable riding on major roads without bike lanes. By contrast, less than a third (30%) of female cyclists ride in this type of traffic environment with ease. Figure 2 shows the gender differences between cyclists' comfort level riding on major roads without bike lanes.

Further research may help to determine why it is that women are less comfortable than men are on these roads, but this should not divert attention away from the fact that the current traffic environment itself is clearly challenging for most women and men. Furthermore, the majority of both female and male cyclists would rather not ride on roads with no bicycle facilities, so simply moving ahead with the building of more bike lanes and paths does seem warranted.

Figure 2. Male and Female Cyclists: Comfort Level Cycling on Major Roads without Bike Lanes



1.2 Racial Differences in Willingness to Cycle and Barriers to Cycling

There were quite marked differences in attitudes toward cycling between white and visible minority respondents. Overall, white respondents were more interested in cycling than were visible minorities. Eighty-two percent of the 136 white respondents were cyclists and only 51% of the 39 considered visible minorities cycled.

Of the 113 respondents who provided their visible minority status and who would like to cycle or cycle more, 19 were visible minorities (49% of all visible minorities surveyed) and 94 (69% of all white respondents) were not. The relationship between willingness to cycle and visible minority status is a significant one, ($r=-.1707$, $n=173$, $p<.05$) revealing that white respondents were more interested in cycling than visible minorities.

Each of the nine barriers was identified by a greater percentage of visible minorities than white respondents as an issue of concern. The most significant barrier for both whites and visible minorities was the amount and speed of motor vehicle traffic. Seventy-four percent of white respondents and 81% of visible minorities agreed this was a significant concern.

The other cycling barrier of note was: "I live too far from most places I need to go to ride a bike there." Only 20% of white respondents agreed compared to 46% of visible minorities. This makes sense based on settlement patterns in Toronto.

Unlike U.S. cities and their suburbs, Toronto's downtown core "has a slightly lower immigrant and visible minority population than its suburbs." (Smith Lea, 2000: 55) And most people, even those of average fitness, find the distance prohibitive for cycling between Toronto's inner suburbs and downtown.

The presence of cycling barriers impacts whites and visible minorities differently. Figure 3 shows differences between white respondents and visible minorities in terms of the relationship between cycling barriers and interest in cycling. Two of the four quadrants show significant differences between the groups.

The first is the quadrant which shows that there is a much higher percentage of white respondents (51%) than visible minorities (32%) who are in the "no barriers" category and are interested in cycling. The second quadrant of note shows those who had barriers and were NOT interested in cycling more than they do. This describes nearly a half of the visible minorities (45%) yet only 9% of the white respondents. So not only do white respondents experience fewer barriers to cycling than visible minorities, but the presence of barriers has a much greater impact on interest in cycling for visible minorities than whites.

There were also significant differences between white and visible minority respondents who were cyclists in terms of their comfort level riding on major roads without bike lanes (see figure 4). While 44% of the white cyclists said they were comfortable riding on major roads without bike lanes, only 16% of the visible minority cyclists did.

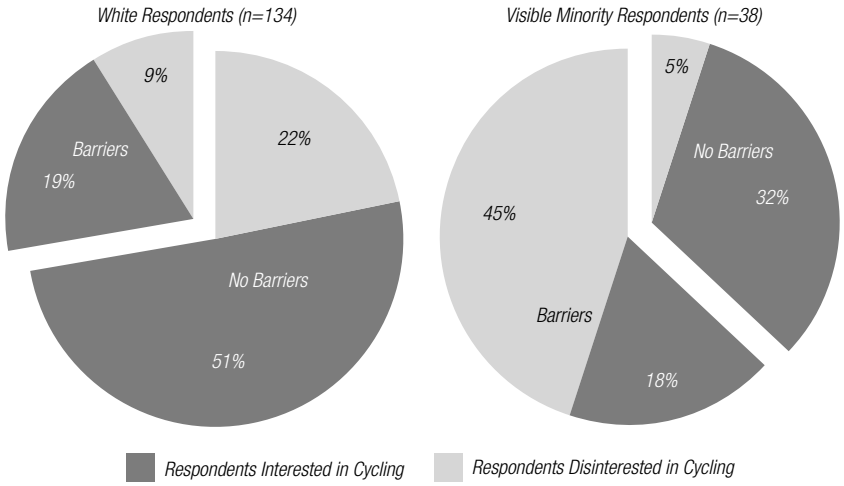
Further analysis was conducted to try to determine why visible minorities experience more barriers to cycling than white

respondents. Two potential contributing factors relating to immigrant status were explored and discarded. The first was whether or not a relationship exists between visible minority status and immigrant status. However, there were no differences in terms of willingness to cycle between visible minorities who were born in Canada and those who were not.

The second avenue that was explored was whether or not immigrants came to Canada from a country considered "bicycle friendly" — that is, where there are social supports in place for cycling and a greater percentage of the population that cycles. However, country of origin did not seem to have a bearing on subsequent willingness to cycle within Canada.

While more research is needed in this area, it does seem clear though that both visible minorities and women face greater barriers to cycling and there is a subsequent impact on willingness to cycle. Assuming that our goal is to see more cyclists on the road, with increased safety and comfort levels for all, how can we proceed to address the inequities outlined above?

Figure 3. Relationship Between Cycling Interest and Barriers to Cycling for White and Visible Minority Respondents



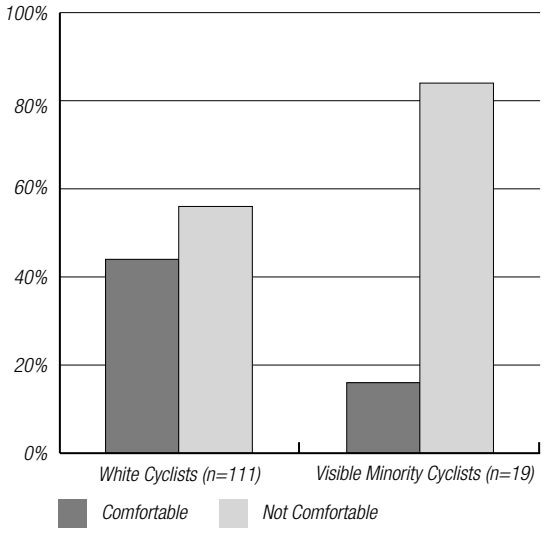
2. Attitudes Toward Individual and Social Cycling Solutions

There were six questionnaire items about cycling safety solutions. Two solutions relied on an individual response: 1) required cyclist training; and 2) cyclist helmet law. Four relied on more systemic changes: 1) bike lanes/paths; 2) required motorist training; 3) right of way hierarchy favouring pedestrians and cyclists; and 4) lower fines for cycling traffic offenses.

The majority of the survey respondents indicated that all six solutions have merit but two solutions stood out as being highly favoured. Nearly all respondents (94%) agreed with increasing the number of bike lanes and paths in Toronto and 89% agreed that motorists should be required to receive training in how to drive near cyclists.

Overall there was more moderate support expressed for individual cycling safety solutions (64% in agreement) than systemic changes (81% in agreement). There were also interesting differences between groups in terms of support for individualistic versus systemic solutions as elaborated below.

Figure 4. White and Visible Minority Cyclists: Comfort Level Cycling on Major Roads without Bike Lanes



2.1 Cyclist/Non-Cyclist Differences in Attitudes toward Cycling Solutions

It was hypothesized that those who are not cycling presently are not doing so because these more social solutions are not in place. As expected, a majority of the non-cyclists in this study identified more barriers to cycling than cyclists but it was those respondents who were cyclists that were more supportive of systemic solutions while non-cyclists supported personal over social solutions.

Research, however, suggests that support for safety measures has less to do with the solution being proposed than with the

Cyclists were more supportive of systemic solutions while non-cyclists supported personal over social solutions.

Figure 5. Sex Differences Between Cyclists and Non-Cyclists in Support of Two Types of Cycling Solutions

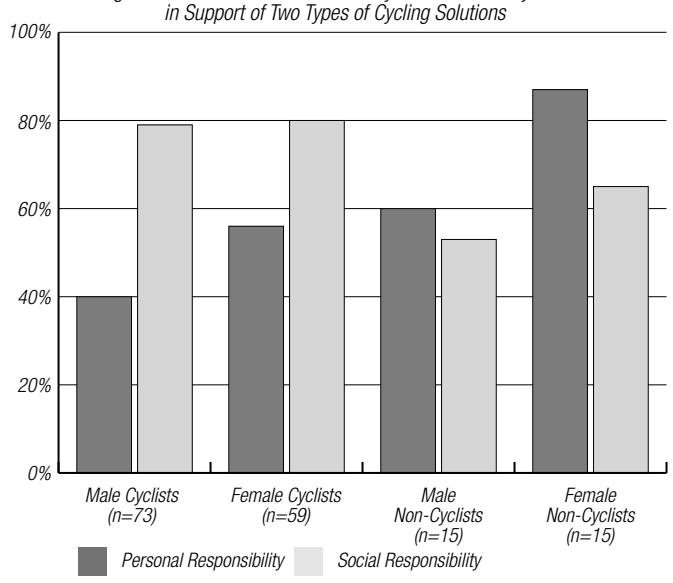
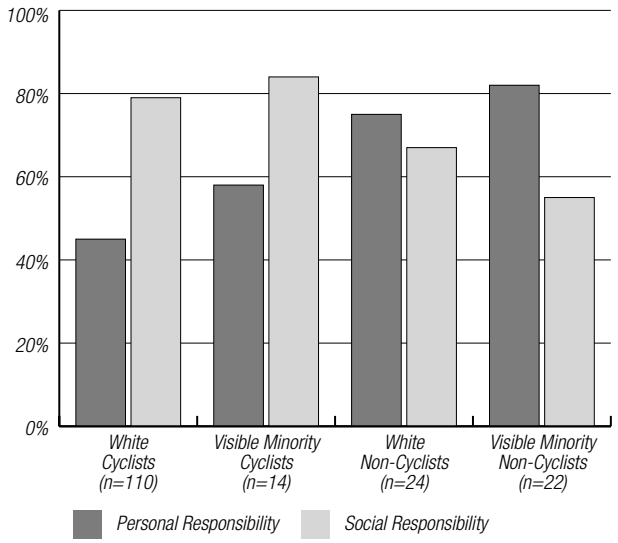


Figure 6. Racial Differences Between Cyclists and Non-Cyclists in Support of Two Types of Cycling Solutions



individuals' perception of the riskiness of the activity. Noland (1992) surveyed cyclists in Philadelphia and found that those wearing helmets and female cyclists overall had a higher perception of the risk of bicycling. This could explain why respondents were supportive of both personal and social solutions to cycling safety. If one feels at risk it is reasonable to take as many precautions as possible.

2.2 Sex and Racial Differences in Attitudes toward Cycling Solutions

The majority of the non-cyclists in this study were women. Women also identified more barriers to cycling than men and the female cyclists expressed a lower comfort level with cycling on major roads than male cyclists did. Given this, it was not surprising that women expressed stronger support for systemic solutions than men did, as can be seen in Figure 5. What was surprising was that female respondents, both cyclists and non-cyclists, were significantly more in favour of personal solutions than men were.

Also surprising was that visible minorities — cyclists and non-cyclists — were much more in favour of personal solutions than white respondents were.

A similar pattern was found in terms of differences between white and visible minority respondents. Visible minorities identified more barriers to cycling than whites and the visible minority cyclists expressed a lower comfort level with cycling on major roads than white cyclists did. As expected, visible minority cyclists expressed stronger support for systemic solutions than white cyclists did, as can be seen in Figure 6.

Unexpectedly though, visible minority non-cyclists were less supportive of systemic solutions than white non-cyclists. Also surprising was that visible minorities, both cyclists and non-cyclists, were much more in favour of personal solutions than white respondents were.

Another relationship between variables that shows up in this dataset—the differing comfort level of cyclists—provides a broader picture of the differences in attitudes toward the two solution types.

2.3 Comfort Level Differences in Cyclists' Attitudes toward Cycling Solutions

The conjecture has been made and widely proliferated that cyclists who are apprehensive about riding a bike in traffic have a "phobia" that can be eliminated through a rigourous training program teaching that "cyclists can travel with speed and safety almost everywhere the road system goes." (Forester, 1994: 1)

While skill and experience undoubtedly increase the confidence of most cyclists, there are many who will never be comfortable riding in heavy traffic, no matter how much exposure they have. That individual differences occur between cyclists is not good or bad, rather it is a result of being human.

Hiles (1996) aims to get beyond the misleading dichotomy of confident = skilled and unconfident = novice by making the distinction between those cyclists who have high and low traffic tolerance. Traffic tolerance refers "to the the relative

level of stress a bicyclist feels while riding amidst motor traffic." Beyond traffic tolerance is "traffic preference" as in, "even some bicyclists who have high traffic tolerance prefer a distinct separation between bicyclists and motorists." (Hiles, 1996: Chapter 8)

The cyclists in this study supported the two solution types quite differently depending upon whether or not they felt comfortable cycling on major roads without bike lanes. Those cyclists not comfortable riding under these conditions were more likely than more confident cyclists to support personal solutions. More than half (43 of the 80 or 54%) of the cyclists not comfortable on major roads without bike lanes supported personal solutions while only 19 of the 52 (37%) of those comfortable did.

Support for social responsibility was similarly high for both those cyclists who were comfortable and those who were not, although a bit higher for the latter. Sixty-five of the 80 cyclists (81%) expressing discomfort and 40 of the 52 (77%) who were comfortable supported social solutions.

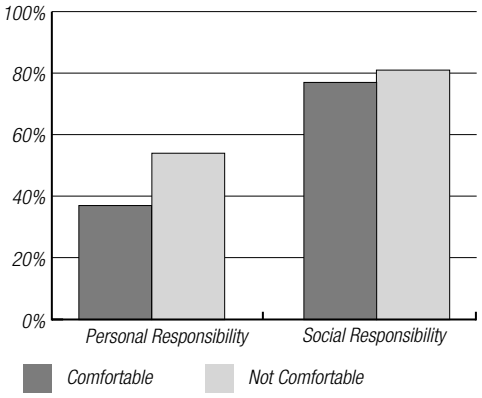
So cyclists, regardless of their comfort level, were similarly supportive of bike lanes and other systemic improvements. This finding supports Hiles' theory that regardless of traffic tolerance, there exists a widespread preference for cycling-specific traffic enhancements.

CONCLUSION

This research confirms that women and visible minorities experience greater deterrents to cycling than white men. A greater percentage of white, male cyclists in this study were comfortable riding on major roads without bike lanes than were visible minority and female cyclists. In terms of solutions, there was weak overall support (55%) in favour of personal measures to increase cycling safety while systemic solutions were supported much more strongly (76% in favour.) The strongest support for individualistic solutions was expressed by non-cyclists. Cyclists, on the other hand, were much more likely to support systemic solutions.

Systemic solutions enjoy broader popular support than the individualistic approach but neither has the whole picture and a concentration on one approach to the exclusion of the other should be avoided. Establishing depolarized guiding principles to inform the decision-making processes around cycling safety would help to achieve the prevailing goal which is for a safer and more equitable traffic environment for all cyclists.

Figure 7. Support for Two Types of Cycling Solutions by Cyclists' Comfort Levels on Major Roads without Bike Lanes



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