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Title: IDENTIFICATION OF OPINIONS THAT UNIVERSITY BICYCLISTS AND PEDESTRIANS POSSESS REGARDING THEIR SAFETY FROM A BICYCLE TRAFFIC-RELATED INJURY ON CAMPUS

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Abstract approved: ____________________

David C. Lawson

This study investigated the opinions of bicyclists/pedestrians regarding how safe from a bicycle traffic injury they felt while on campus. Most earlier studies had been concerned with the taxonomy of bicycle/pedestrian accidents. Because of the paucity of research on attitudes of bicyclists and pedestrians, this research was undertaken.

The survey instrument was developed in accordance with recommendations from the Oregon State University Survey & Research Center. It consisted of 19 Likert type, degree of variation statements, and ten biographical questions. The sample consisted of 214 students registered for the winter term of 1986 at Oregon State University.

Participants completed the Traffic Safety Attitude Survey and then were placed in the following categories: male, female, bicyclists, and pedestrians. The Survey instrument was designed to

test four null hypotheses and to define other broadly held opinions regarding traffic safety on campus. Hypotheses One through Three tested interaction between bicyclists/pedestrians. The fourth hypothesis tested the difference between male bicyclists and male pedestrians and female bicyclists and female pedestrians. The Chi Square Test and a two-way analysis of variance were employed to test the hypotheses.

Two significant findings emerged from hypothesis testing: 1) bicyclists and pedestrians differed on the opinion that as much as possible is being done to provide campus bicycle traffic safety, and 2) pedestrians endorsed stricter adherence to bicycle traffic regulations than bicyclists. There was no difference between bicyclists and pedestrians regarding feelings of safety from a bicycle traffic-related injury. Finally, gender had no effect on perceptions of campus bicycle traffic safety.

Analysis of the results of this research provided the following conclusions:

1. Male bicyclists felt the least at risk of injury from a bicycle traffic-related injury on campus.
2. Female pedestrians felt the most risk of injury from a bicycle traffic accident on campus.
3. Female bicyclists, female pedestrians, and male pedestrians shared similar opinions regarding risk of exposure to a bicycle traffic accident on campus.
4. Approximately 30% of all subjects felt there is a problem with interaction between bicyclists and pedestrians on the OSU campus.
5. Approximately 46% of the pedestrians and 25% of the bicyclists felt risk of sustaining a bicycle traffic-related injury on campus.
6. Approximately 38% of the pedestrians and 25% of the bicyclists support some form of bicycle traffic restriction.
7. Pedestrians endorse stricter adherance to bicycle traffic regulations that bicyclists do.

8. Pedestrians felt less is being done to ensure bicycle traffic safety on campus than bicyclists did.

IDENTIFICATION OF OPINIONS
THAT UNIVERSITY BICYCLISTS AND PEDESTRIANS
POSSESS REGARDING THEIR SAFETY FROM A BICYCLE
TRAFFIC-RELATED INJURY ON CAMPUS

by

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DEDICATION

To Karri, my wife and counterbalance.

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## I: INTRODUCTION

Biking and walking. These two transportation forms are non-polluting, healthy, energy efficient, and noiseless, yet they are not without their problems. National Safety Council (NSC) accident statistics for 1984 reveal 91 hundred fatalities and 120 thousand reported medical emergencies involving these two groups. Due to inconsistencies in reporting systems and under-reporting, the NSC estimates that between 500 thousand and 1 million accidents actually occurred. It has been suggested that non-motorized vehicle (NMV) accidents may account for 99% of all vehicle accidents (U.S. Attorney General, 1981). Furthermore, the estimated costs of public NMV accidents for 1984 were approximately $7.2 billion. This figure includes wage loss, medical expense, and administration of insurance policies and programs. What these figures cannot include is the substantial cost of physical and emotional suffering.

Due to inadequacies of national accident and injury reporting systems, it is impossible to classify bicycle and pedestrian accidents. The majority of accidents between these groups are often not serious enough to be recorded, and frequently there is no report made by those involved in the accident. In addition, very few studies have been concerned with interaction of bicyclists and pedestrians.

Little is known about why unsafe behaviors occur among pedestrians and bicyclists. Some reasonable theories that may explain these behaviors follow:

1. Inconsistent enforcement of bicyclist and pedestrian traffic regulations may create confusion as to what role is is expected (Maudep-Kearns, 1975).

2. Lax enforcement of traffic regulations may create attitudes of noncompliance (Haight, et al., 1980).
3. Age, sex, and experience of the individual may effect safe behavior (Wheatley & Cross, 1979).
4. Inability to perceive and classify speeds of approaching objects increases accident occurrence (Salvatore, 1974, from Fortenberry & Brown, 1982).

These causes combined with mixing of bicyclist and pedestrian traffic may be the primary reasons for bicycle/pedestrian accidents.

Evidence from a bike path survey indicated that bicyclist/pedestrian accidents may increase dramatically when cyclists and pedestrians are permitted to use the same path (Cross, 1979). Other documentation for the increase of bicyclist/pedestrian accident rates comes from data on the incidence of bicyclist/pedestrian accidents on college and university campuses (Cross, 1979).

Bicyclist/pedestrian accidents involve a larger proportion of the adult population than one might expect, and demographics of those involved in these accidents are changing. The proportion of deaths of adolescents and adults resulting from bicyclist/pedestrian accidents has risen steadily since 1960. Persons 15 years of age and older accounted for more than one-half the deaths in 1983 compared to about one-fifth in 1960 (NSC, 1984). Cross & Wheatley (1979) determined that accidents between bicyclists/pedestrians more often involve older riders than younger.

Research studies also show an accident rate four times higher for bicyclist/pedestrian collisions among the general public than for club bicyclists (Kaplan,1976). (See Table 1.) These trends indicate the need for research in the area of bicyclist/pedestrian safety in environments limited to bicyclist and pedestrian travel.

Table 1. Bicyclist Accident Rate by Bicyclist Type. (Forester, 1984).

| TYPE | MILES PER ACCIDENT |
|---|---|
| Children | 1,500 |
| College associated adults | 2,000 |
| Club cyclists | 10,000 |

## Statement of the Problem

The primary purpose of this investigation was to obtain opinions of students on campus regarding their perception of safety from a traffic-related injury. Interest in the subject arose as result of research that identified attitudes of bicyclists and pedestrians using campus facilities as a growing social problem (Cross, 1979). Consequently, this research identified existing attitudes through a survey of opinions. The objective of this research was to ascertain how safe bicyclists/pedestrians perceive the university traffic safety environment to be. It was assumed that knowledge of this perception of safety might indicate receptivity to safety programs.

Safety attitudes were measured by a "Traffic Safety Opinion Survey" developed by this researcher. Scores on the attitude scale represented the dependent variables in the study. The independent variables used were bicyclists, gender, and pedestrians. The following four hypotheses were developed to evaluate the data:

1. There is no significant difference between the feelings of a bicyclist and pedestrian regarding safety from a traffic-related injury while on campus.

2. There is no significant difference between the feelings of bicyclists and pedestrians regarding strict enforcement of bicycle regulations.
3. There is no significant difference between opinions of bicyclists and pedestrians regarding whether or not as much as possible is being done to protect them from a traffic related injury while on campus.
4. There is no significant difference between male and female attitudes on their perception of campus traffic safety.

These hypotheses were tested utilizing the Analysis of Variance (ANOVA) and Chi Square procedures.

## Additional Research Questions

The following additional questions of related importance to this study were answered through an analysis of the survey statements:

1. What is the general feeling concerning traffic safety on campus?
2. Do pedestrians feel more could be done to ensure their safety on campus?
3. Should prohibitions be placed on bicycle travel?
4. Are traffic regulations enforced adequately?

## Limitations of the Study

The limiting factors in the study were as follows:

1. Participants consisted of students enrolled

2. Participants were not placed into bicyclist or pedestrian categories until the survey was returned.
3. Participants at Oregon State University could be placed into one of two categories: 1) bicyclists who rode their bikes at least three times per month on campus, and 2) pedestrians who walked.
4. Measurement of attitude was determined from a questionnaire developed by this researcher to accomodate the specific objectives of this study.

## Assumptions

This study was based on the following assumptions:

1. Use of a university population would control some of the extraneous variables that might confound the results such as the lack of vehicular traffic on campus, less exposure to risk, and similar variables,
2. The research instrument would validly assess attitudes regarding a safe environment,
3. A randomized sample would produce ratios of bicyclists to pedestrians and females to males that were consistent with current university enrollment, and
4. Subjects would respond honestly to the items of the instrument.

## Definition of Terms

The following definitions are provided for the present research study:

Accident: An accident is the unexpected or uncontrolled release of energy that results in injury and/or damage.

Attitude: Likert (1932), described an attitude as a human element within which responses move in a predetermined range. Attitude is frequently compared to opinion, with the former being more of a global concept, and opinion a more specific predisposition (Thurstone, 1931; Lemon, 1973; Hovland, et al., 1973).

Bicyclist: A person that rides a bicycle at least three times per month on campus (Cross, 1979).

Halo Effect: A tendency to group answers to questions consistently in one extreme (Cook & Selltiz, 1964).

Opinion: A verbal expression of attitude (Thurstone, 1929).

Pedestrian: A person that usually travels on foot while on campus.

Restricted Environment: Traffic environments limited to pedestrians, bicyclists, emergency and service vehicles.

Safety: Freedom from danger, injury, or damage; security (Webster, 1984).

Safety Attitude: A safety attitude is defined as the degree of positive or negative feeling toward safety (Kroeger, 1980).

# II. REVIEW OF LITERATURE

The literature reviewed in this chapter provides background information in the following areas: relationship of attitudes to opinions, effect of attitudes on behavior, measurement of attitudes using the Likert method, and attitudes associated with safe behavior. This chapter will explain how attitudes and opinions can be assessed and used to determine beliefs.

## Relation of Attitudes to Opinions

A single definition of attitude is not as simple as it might appear. Past research (Hovland, Janis, and Kelley, 1953; Guilford, 1954; Shaw 1966) described an attitude as being similar to other subjective personality traits, and being occasionally interchanged with terms such as motive, opinion, and response predispositions. The thread that runs through most social science research concerning attitudes is that they are a personal disposition specific to individuals, but are possessed to different degrees which impels a person to react in ways that can be called favorable or unfavorable. While attitudes are subject to change, their directions and strengths are sufficiently enduring over periods of time to justify treating them as personality traits (Guilford, 1954; Henerson, 1978).

Social psychologists have identified the central components of an attitude as the affective, cognitive, and behavioral components. Additionally (Jastrow, 1927) pointed out that the human mind is a belief-seeking rather than a fact-seeking apparatus. He further stated that belief is any simple proposition, conscious or unconscious, inferred from what a person says or does, capable of being preceded by the phrase, "I believe that...." The content of a belief may describe the object of belief as true or false; correct or incorrect; good or bad; or it may advocate a certain course of action or a certain state of existence as desirable or undesirable.

Rokeach (1968) added that each belief within an attitude organization is conceived to have three components: 1) the cognitive component which represents a person's knowledge, and is held with varying degrees of certitude, 2) the affective component which is derived from the fact that under suitable conditions the belief is capable of arousing effects of varying intensity, and 3) a behavioral component which is due to the belief that a response predisposition of varying threshold must lead to some action when it is suitably activated.

Harding, Kutner, Proshansky, and Chein (1954) pointed out that the relationship among these three components is so close that it makes little difference which is used to rank individuals with respect to their attitudes. Rokeach (1968) stated that concepts such as harmony, balance, strain toward symmetry, congruity, and dissonance play important theoretical roles. These theories share the assumption that man strives to maintain consistency among cognitive, affective, and behavioral components within a single belief, two or more related beliefs, and into all beliefs entering into attitude organization.

The relation between attitude and opinion is an analogous one (Lemon, 1973). The central concept used in development of the instruments used to measure attitudes relies on personal opinion. It has been proposed that social attitudes can be measured by the opinions that individuals will endorse as their own, and that opinions can be calibrated (Thurstone, 1928). The accepted view is that an opinion is a manifestation of an attitude, and that opinions can therefore be used to diagnose an underlying predisposition (Likert, 1928; Thurstone, 1931).

Finally, Thurstone and Chave (1929) defined opinion as a verbal expression of some belief, attitude, or value, and stated that they would use opinions as the means for measuring attitudes. Rokeach (1968) pointed out that the present concept views opinion as a possible expression of a belief or value as well as an attitude, and also views an opinion as being a possible manifestation of an attitude of altogether different content.

## Effect of Attitudes on Behavior

The question here concerns whether one's attitude determines one's behavior. Early researchers (Baldwin, 1901; Thomas and Znaniecki, 1918; Watson, 1925) assumed that attitudes could be used to explain human action. This assumption evolved because attitudes were viewed as behavioral disposition, or that behavior may be predicted by attitudes.

Richard LaPiere's investigation of racial prejudice raised doubts about a relationship between attitude and behavior. LaPiere noted a significant difference between how innkeepers responded to correspondence as compared to a personal request for lodging from a Chinese couple (LaPiere, 1934). Doob (1947) saw no relationship between attitudes toward an object and any given behavior with respect to that object. This interim research disputed any strong relationship between attitudes and behavior.

However, Katz and Stotland (1959) conceptualized the framework of the theory of cognition, affect, and behavior and this multicomponent view of attitudes was widely accepted. Rosenburg and Hovland (1960) further developed this theory and proceeded to describe how any response to a stimulus object is mediated by the person's attitude toward the object. The responses are classified into three categories: 1) cognitive, perceptual responses and verbal statements of belief, 2) affective, sympathetic nervous responses and verbal statements of affect, and 3) behavioral, covert actions and verbal statements concerning behavior.

Results of current research have indicated that attitudes can be used to predict behavior. Ajzen and Fishbein wrote as follows:

> ...this multicomponent view of attitude was adopted almost universally and attitudes were viewed as complex systems comprising the person's beliefs about the object, his feelings toward the object, and his action tendencies with respect to the object. Given this inclusive view of attitude as encompassing all the person's experiences with respect to the object, it would be difficult to assume anything other than a strong relationship between attitude and behavior (Ajzen & Fishbein, 1980, p.19).

In summary, this section supports the assumption that there is a strong relationship between attitude and behavior. Early research, 1900 to 1920, supported the theory of a relationship between attitude and behavior. Interim research, 1930 to 1950, disputed any relationship between attitude and behavior. Finally, recent research, 1960 to the present, has developed the multi-component view of an attitude. This view establishes a strong relationship between attitude and behavior.

## Attitude Measurement

Knowing the average attitudes of a group is valuable in dealing with the social problems of that group (Lemon, 1973). Thurstone (1928) was among the first to suggest that social attitudes can be measured by opinions that individuals will endorse as their own, and that these opinions can be calibrated.

The most common methods used to develop a single dimension attitude score are the Equal Appearing Intervals by Thurstone & Chave, Scalogram Analysis by Gutman, and Summative Scaling by Likert. Guilford (1954) concluded that it was a common finding that the Likert method led to scores with higher reliabilities with fewer items than did the Thurstone method. Summers (1971) concluded that Likert method of scoring an attitude scale consistently produces more reliable results than the Thurstone method of scoring the scale (Likert,1932; Likert, Roslow, & Murphy 1938; Ferguson, 1941).

Likert developed his scaling technique by extensive empirical tests of the actual coherence or clustering of attitudes on a variety of public issue questionnaires (1932). Construction and validation of such an attitude questionnaire should be done whenever a particular attitude must be identified. It is reasonable to suppose that just as an intelligence test which has been standardized upon one cultural group is not applicable to another, so an attitude scale which has been constructed for one cultural group will hardly be applicable to another (Thurstone, 1931).

In construction of an attitude scale, the statements used must be presented so as to permit "judgment of value" as opposed to "judgment of fact." Phrases containing terms such as should, ought to, not allowed, etc. should not be used. Each statement should be clear, consise, and simply worded; it should not have a double meaning. The modal reaction to it should be approximately in the middle of possible responses. Half the statements should correspond with strongly approve, the other half with strongly disapprove, which reduces a tendency to answer questions consistently in the extreme (Cook & Selltiz, 1964). Litwak (1956) in an effort to control biased questions, cautioned against loaded, vague, and double-barreled questions. The ideal questionnaire will not have too many, too few, or inappropriate dimensions.

(Lazarsfeld & Barton, 1951) recommended the following stages of measurement for a questionnaire instrument:

1. Form an image of the concept to be measured,
2. Specify the relative dimensions of the concept to serve as a basis,
3. Translate theoretical ideas into practice and search for indicators which represent the theoretical concepts guiding the research,
4. Combine scores from the indicators into indices which represent the underlying attitudes (p.65).

The final scale may include statements that correlate satisfactorily with the final score. The split half reliability of each statement should be found by correlating the sum of the odd statements for each individual against the sum of the even. All statements may be correlated with each other so patterns can be identified. If patterns emerge, it may be necessary to separate subscales or eliminate statements. This criterion of internal consistency should be tried and the results obtained should be found to be comparable to an item analysis. The final questionnaire should consist of approximately 20 statements (Likert, 1932; Lemon, 1973).

## Attitudes and Safety

Safety involves an attitude of safety consciousness. An attitude of carelessness has been noted to be more prevalent in children who experience accidents than those who do not (World Health Organization, 1957). Schulzinger (1956) identified poor attitude as being the primary contributor to industrial accidents.

The Eno Foundation (Traffic Quarterly, 1956) prescribed the following methods for initiating driver attitude changes:

1. Expose the subject to the results of his or her attitude.
2. Expose the subject to videos designed to bring out favorable or unfavorable attitudes.
3. Re-teach procedure to acheive correct attitude. This procedure has proven successful in tests performed by Agan, Conover, and Siebrecht (Haddon, 1964).
4. Expose the subject to a lecture on the situation for which the attitude is being measured.
5. Provide printed arguments and propaganda to stimulate shifts to the desired attitude.

Conover (from Haddon, 1964), using the Conover Driver Attitude Inventory, showed positive behavioral shifts when subjects were exposed to pretest-postest sequence involving attitudes. The instrument used was similar to the Likert five point degree of variation scale.

In considering accidents of all types, it has been advocated that sociological analysis be brought to bear upon relationships between attitudes toward safety and accident rates (Hacker & Suchman, 1963). Their research indicated that data concerning pedestrian behavior toward road safety attitudes is lacking. Haddon (1964) supported this by recognizing the prominence of attitude research in sociology and expressed surprise at the lack of research being done on attitudes toward accidents.

## Summary

The need for a controlled study to identify safety attitudes was demonstrated through a review of literature. A discussion of attitude-related literature provided background regarding the importance of attitudes and their relation to behavior. Techniques available to measure attitudes and thereby to identify possible behaviors were also examined. Finally, a review of safety literature and programs revealed the need for research to establish links between safe attitudes and behavior prior to the implementation of traffic safety programs.

# III: METHODS AND PROCEDURES

This study investigated the opinions of university bicyclists/pedestrians regarding their perception of safety from a traffic-related injury while on campus. Opinions were obtained with the use of a survey questionnaire. Biographical information was obtained through the same instrument.

## Sample

This study was conducted at Oregon State University which is a member of the Oregon State System of Higher Education and is located in Corvallis, Oregon. OSU is a public, coeducational, Land & Sea Grant institution serving approximately 15,000 students.

The Student Data System Access Program, available through the Registrar's Office, was used to randomly generate a list of 300 names for participation. All subjects were students enrolled during the winter term of 1986. These participants were then placed in either the bicyclist or pedestrian category. Cross (1979) developed the criteria that bicyclists were people who rode their bicycle at least three times per month regardless of distance. The present study used similar criteria to identify bicyclists which produced a 42% to 58% bicyclist to pedestrian ratio. This ratio is consistent with campus Traffic Department records.

A total of 300 students were mailed the instrument, of which 214 returned the survey. This resulted in a 72% return rate. This group was further divided into

BICYCLISTS : 64 males, 25 females (N = 89)
PEDESTRIANS: 64 males, 61 females (N = 125)

The university setting (motor vehicles not allowed) was selected as the environment for this study in order to control the extraneous variable of the presence of vehicular traffic that might contaminate the results.

A confidence coefficient of .9 required sampling one per cent of the population being studied. The 1986 winter term student population at Oregon State University was 14,874, so returns were needed from at least 150 people. This survey included 214 subjects which exceeded requirements. This process was recommended by the Oregon State University Survey and Research Center.

## Construct Development

The Likert format was selected to measure attitudes that describe how bicyclists and pedestrians view their safety. The original Likert "Survey of Opinions" was developed in 1929 by Dr. Rensis Likert. The reasons for its development were to provide a simpler alternative to the Thurstone technique, with ease of application and as much or more accuracy.

The original scale contained the following three types of statements. The five-point multiple choice, the five-point degrees of variation, and the three point YES-UNDECIDED-NO. Analysis of the questions by Likert determined that the three point questions had the lowest degree of reliability. Consequently this research used the five-point degree of variation statements in the instrument. Each statement was then analyzed to

1. Assign numerical values, and
2. Determine whether the statements measured what the instrument was intended to measure (Thurstone, 1931).

This analysis process can be accomplished by either of two methods. The "item analysis" requires calculating the correlation coefficient of each statement within the instrument and will ensure satisfaction in the measurement of the attitudes. However, the "criterion of internal consistency" was demonstrated by Likert to correlate highly (.91), with the item analysis without the use of extensive calculations. The criterion of internal consistency compares the mean attitude score of subjects with the high and low quartile.

## The Survey Instrument

The survey instrument used in this research is a Likert style instrument developed by this researcher (see Appendix A). The pilot instrument contained 38 statements plus biographical information which was subjected to a pre-test in accordance to Mail and Telephone Surveys (Dillman, 1977). Dillman stated that the most effective questionnaires are pre-tested on a group similar to the test group and a group familiar with this type of project. Consequently, this instrument was pre-tested by 40 randomly selected Oregon State University students and a group of ten safety educators from national universities which had safety curricula. (See Appendix B for cover letters.). Of the 38 statements, the 19 that showed the highest degree of discrimination and the appropriate dimension were selected for the actual Traffic Safety Attitude Survey.

Development of a Likert style instrument requires that individual instrument items be subjected to some form of validation (Likert, 1932). This validation would ensure the following two qualities:

1. Discrimination, for example, subjects may be divided into two distinct categories.

2. Prevention of the "halo effect," for example, an individual's responses will divide equally into both extremes.

Next, the instrument mean is computed for the upper and lower quartile. Significance values are then determined for each item using the instrument mean as the dependent variable and bicyclists/pedestrians as the independent variables. Statements with a p-value greater than .05 are rejected. Statements 3, 4, 10, and 19 had p-values that exceeded .05 and consequently were not used to test any hypotheses. Table 2 shows the statement responses for the upper and lower quartile along with their associated p-value.

Table 2. Agreement Scale and Statement Significance, Utilizing Upper & Lower Quartile.

| Statement No. | Response Choices 25 Low Scores SA | A | U | D | SD | Response Choices 25 High Scores SA | A | U | D | SD | Significance |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 18 | 28 | 07 | 03 | 01 | 06 | 18 | 13 | 18 | 04 | .0002 |
| 2 | 06 | 19 | 07 | 18 | 07 | 02 | 10 | 15 | 27 | 07 | .0523 |
| 3 | 11 | 23 | 01 | 11 | 10 | 18 | 19 | 04 | 13 | 07 | .3594 |
| 4 | 01 | 10 | 09 | 20 | 17 | 07 | 09 | 10 | 22 | 13 | .2768 |
| 5 | 10 | 16 | 11 | 18 | 01 | 00 | 02 | 03 | 38 | 18 | .0000 |
| 6 | 12 | 28 | 14 | 01 | 00 | 01 | 04 | 20 | 25 | 11 | .0000 |
| 7 | 31 | 22 | 02 | 01 | 01 | 07 | 24 | 12 | 11 | 06 | .0000 |
| 8 | 32 | 18 | 02 | 04 | 01 | 04 | 09 | 05 | 29 | 14 | .0000 |
| 9 | 06 | 14 | 04 | 23 | 10 | 00 | 02 | 05 | 17 | 37 | .0000 |
| 10 | 03 | 13 | 14 | 10 | 15 | 05 | 23 | 17 | 10 | 06 | .1290 |
| 11 | 01 | 04 | 15 | 23 | 14 | 03 | 10 | 29 | 15 | 03 | .0022 |
| 12 | 21 | 28 | 06 | 01 | 00 | 00 | 09 | 13 | 35 | 04 | .0000 |
| 13 | 06 | 38 | 03 | 04 | 03 | 03 | 18 | 11 | 26 | 03 | .0000 |
| 14 | 07 | 28 | 13 | 09 | 00 | 00 | 11 | 07 | 34 | 09 | .0000 |
| 15 | 52 | 05 | 00 | 00 | 00 | 17 | 32 | 05 | 04 | 02 | .0000 |
| 16 | 10 | 24 | 13 | 07 | 01 | 01 | 11 | 09 | 28 | 11 | .0000 |
| 17 | 09 | 23 | 19 | 03 | 01 | 00 | 07 | 17 | 27 | 10 | .0000 |
| 18 | 30 | 19 | 03 | 03 | 02 | 07 | 18 | 12 | 21 | 03 | .0000 |
| 19 | 12 | 12 | 11 | 14 | 08 | 05 | 10 | 08 | 23 | 15 | .1020 |

SA = Strongly Agree, A = Agree, U = Undecided, D = Disagree
SD = Strongly Disagree

The original Likert scale used the sigma method for scoring. Based on the results of others (Rice, 1928; Folsom, 1931) this technique assumes that attitudes are distributed fairly normally; consequently the sigma method which states that all cases fall between -3 and +3 sigma on a standard distribution scale was developed. Using the sigma technique, Likert (1932) obtained a correlation of .77 with the Thurstone-Droba War scale.

However, a simpler method of scoring was developed by Likert that attained a correlation of .993 with the sigma scoring method (1932). This method of scoring assigns a numerical value to the different possible responses and the score for each individual is then determined by finding the mean of the score of the numerical values checked by the respondent. The simplified method was used to score this instrument.

## Biographical Information

A biographical questionnaire accompanied this instrument. The questionnaire described the sample population as a bicyclist or pedestrian, and categorized subjects by gender for data analysis. Information requested from participants included sex, age, terms at Oregon State University, and physical handicaps if any. Additionally, a subjective question regarding their opinion of the severity of the campus accident situation was included.

## Data Collection

Data collection for the pre-test survey and primary survey was facilitated by mail survey. The pre-test survey was followed up with a telephone call, while the actual survey was performed in accordance with the Dillman (1977) method. This method was composed of an initial mailing and three follow-ups. Pre-stamped return envelopes were included in the first and fourth mailing. This process produced a 72% rate of return.

## Statistical Treatment of Data

The purpose of this study was to identify opinions of bicyclists and pedestrians regarding safety from a bicycle traffic-related injury. The initial step in data analysis is the presentation of descriptive statistics which summarize the data collected (Gay, 1976). Use of descriptive statistics allows the results to be organized and condensed into a meaningful format.

In this study, scores on the Campus Safety Instrument represented the subjects' safety attitudes. In order to make comparisons between groups, instrument scores were considered to be indicators of the degree of safety from traffic-related injury which was felt by subjects while on campus. High scores represented a high disagreement in the dimension, while low scores represented a low agreement in that dimension. These assumptions were based on scaling procedures used in construction of the Likert-type scale.

Respondents were asked to indicate the amount of agreement they felt toward 19 statements on the opinion survey. The amount of their agreement varied from Strongly Agree to Strongly Disagree. Table 3 displays how the subjects responded to each statement. The mean of Items 5, 8, and 11 were used as the dependent variables to determine differences between bicyclists and pedestrians, which were then used to test Hypotheses 1, 2, and 3. The results from two, two-way ANOVAs using the mean of the instrument were used to test Hypothesis 4.

Table 3. Selection of Instrument Statements,
All Participants.

| State- | Group I = Bicyclists | | | | | Group II = Pedestrians | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ment | SA | A | U | D | SD | SA | A | U | D | SD |
| 1 | 19 | 34 | 15 | 14 | 05 | 22 | 60 | 22 | 17 | 03 |
| 2 | 06 | 36 | 06 | 31 | 10 | 16 | 56 | 27 | 19 | 06 |
| 3 | 19 | 36 | 04 | 21 | 09 | 31 | 47 | 09 | 22 | 15 |
| 4 | 03 | 16 | 09 | 39 | 22 | 10 | 22 | 22 | 41 | 30 |
| 5 | 07 | 35 | 17 | 19 | 10 | 20 | 61 | 22 | 19 | 03 |
| 6 | 08 | 15 | 23 | 28 | 14 | 08 | 31 | 52 | 27 | 06 |
| 7 | 02 | 02 | 07 | 42 | 35 | 05 | 14 | 20 | 62 | 24 |
| 8 | 05 | 16 | 06 | 32 | 30 | 10 | 38 | 08 | 41 | 28 |
| 9 | 07 | 14 | 06 | 36 | 26 | 01 | 12 | 14 | 44 | 54 |
| 10 | 07 | 20 | 21 | 21 | 19 | 06 | 39 | 36 | 26 | 17 |
| 11 | 14 | 38 | 20 | 12 | 04 | 14 | 39 | 55 | 12 | 05 |
| 12 | 01 | 21 | 14 | 37 | 15 | 04 | 34 | 33 | 42 | 12 |
| 13 | 08 | 41 | 12 | 25 | 03 | 09 | 61 | 21 | 27 | 07 |
| 14 | 05 | 33 | 15 | 29 | 07 | 03 | 38 | 30 | 46 | 08 |
| 15 | 00 | 01 | 00 | 15 | 73 | 02 | 04 | 05 | 58 | 55 |
| 16 | 06 | 26 | 15 | 30 | 11 | 10 | 35 | 31 | 41 | 05 |
| 17 | 09 | 22 | 30 | 19 | 08 | 04 | 29 | 49 | 34 | 08 |
| 18 | 03 | 09 | 08 | 30 | 38 | 04 | 35 | 15 | 51 | 20 |
| 19 | 13 | 33 | 10 | 18 | 14 | 20 | 44 | 20 | 24 | 16 |

## Additional Research Questions

The Traffic Safety Attitude Survey was designed to provide answers to questions concerning restricted traffic environments. This was accomplished by developing survey statements that possess similar dimensions. The second step clustered survey statements into the following similar dimensions:

1. What is the feeling of traffic safety while on campus?
2. Are there too many traffic regulations on campus?

3. Should restrictions be placed on bicycle travel on campus?

4. Are traffic regulations enforced adequately?

The last step was to categorize responses. This made it possible to add similar degrees with statements of the same dimension. However, because the positive end of the spectrum was reversed for half of the items to prevent the halo effect, these scores had to be reversed prior to analysis. For example the statements "I am Safe", "I am not safe" are shown in Figure 1.

| | SA | A | U | D | SD | |
|---|---|---|---|---|---|---|
| I Am Safe | 1 | 2 | 3 | 4 | 5, | 1 = SAFE |
| I Am Not Safe | 1 | 2 | 3 | 4 | 5, | 5 = SAFE |

Figure 1. Example of Statements Having a Positive Dimension on Opposite Ends of the Scale

A safe attitude exists on the "1" end of the scale for the first statement and on the "5" end of the scale for the second statement. In order to combine similar attitudes the scale for one of the statements must be reversed, see Table 4.

Table 4.- Treatment of Statement Responses to Maintain the Left End of the Scale as the Positive End.

| | Positive | Negative |
|---|---|---|
| REGULAR: | SA = 1, A = 2, U = 3, D = 4, SD = 5 | |
| REVERSE: | SA = 5, A = 4, U = 3, D = 2, SD = 1 | |

Finally, similar degrees were assigned the percentage of the total responses assigned by respondents. This percentage would represent the generally held opinion.

# IV: ANALYSIS AND INTERPRETATION OF DATA

This study investigated the opinions held by Oregon State University students concerning their feelings of safety from injury in a bicycle traffic accident on campus. More specifically, it determined if differences in attitude existed among subjects when placed in the following groups: 1) bicyclist, 2) pedestrian, 3) male, and 4) female. In addition, the instrument determined other broadly-held feelings of these groups concerning campus traffic safety.

In order to facilitate the presentation of the data analysis and interpretation, this chapter is divided into four sections. The first section of this chapter discusses the characteristics of the sample studied. The second section discusses the results of hypothesis significance testing. The third section discusses interpretation of the statements to provide answers for the questions of related importance. The last section provides a summary.

## Characteristics of the Sample

The sample for this study consisted of 214 students registered for classes during the winter term of 1986. Of that total, 128 were male and 86 were female. This sample very closely approximated the 60% male, 40% female population ratio enrolled for the test period. Respondents were further classified as 42% bicyclists and 58% pedestrians. The distribution of subjects by gender, travel mode, instrument mean, and score is shown in Table 5.

Table 5. Mean Performance Scores for Groups of Participants in the Traffic Safety Attitude Survey.

| | Group | Mean | Std. Dev. | Cases | Score |
|---|---|---|---|---|---|
| A | BICYCLIST | 2.7572 | .3532 | 89 | 52 |
| 1 | MALE | 2.6979 | .3284 | 64 | 51 |
| 2 | FEMALE | 2.9189 | .3064 | 25 | 56 |
| B | PEDESTRIAN | 2.9650 | .3418 | 125 | 56 |
| 1 | MALE | 2.9501 | .3495 | 64 | 56 |
| 2 | FEMALE | 2.9806 | .3357 | 61 | 57 |
| | ALL SUBJECTS | 2.8786 | .3532 | 214 | 55 |

This instrument used a five degree scale that represented an attitude continuum. The first degree represented the positive end; and the fifth degree represented the negative end of the opinion scale. The mean average of the scale, 2.5, indicated a neutral opinion. As indicated in Table 5, bicyclists with a mean of 2.7572 possessed a slightly negative opinion. The pedestrian mean of 2.9650 indicated an even greater negative opinion regarding safety from a traffic related injury while on campus.

## Results of Hypotheses Testing

This research tested four null hypotheses. 1) The first null hypothesis was formulated to test whether bicyclists and pedestrians had different views regarding their safety from a bicycle traffic-related injury. 2) Hypothesis Two tested whether or not a significant difference existed between opinions of bicyclists and pedestrians regarding how strictly traffic regulations should be enforced. 3) Hypothesis Three stated that there is no significant difference between the opinions of bicyclists and pedestrians regarding the statement that as much as possible is being done to ensure safety from a traffic-related injury on campus. 4) Hypothesis four tested for a significant difference on perception of traffic safety between gender, bicyclists, and pedestrians on the campus.

Hypotheses One, Two, and Three were tested utilizing Chi Square on individual statments from the instrument. Hypothesis Four was tested for significance with the two-way ANOVA utilizing bicyclists, pedestrians, and gender as the independent variables, and the mean of the instrument as the dependent variable. The following discussion will state the hypothesis followed by the statement(s) which was used to test the null hypothesis. Following this will be a table containing the frequency distribution of the percentage of subjects responding to each degree within the statement. Next, a figure displaying the results of the Chi Square Analysis will be presented. Finally, the acceptance or rejection of the hypothesis will be stated.

Hypothesis One

There is no significant difference between how safe a bicyclist feels on campus when compared to the feelings of a pedestrian concerning injury from a bicycle traffic-related injury.

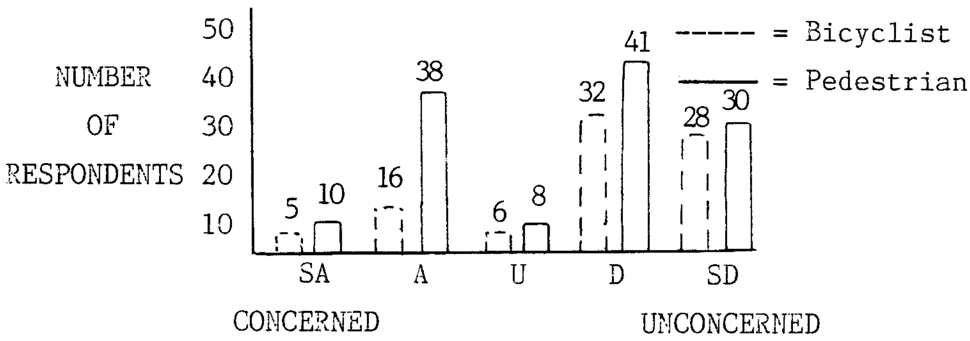
Hypothesis test, Statement Eight. I am concerned about bodily harm from a bicycle accident when walking on campus.

Table 6 exhibits the percentage of the distribution by group in response to Statement Eight. The higher the amount of agreement indicated by a group, the more intense was their concern about injury due to a bicycle/pedestrian accident. As indicated by Table 6, pedestrians were more concerned about traffic-related injuries than were bicyclists. By combining SA with A we see that 38% of the pedestrians exhibited some degree of fear from injury as compared to 24% for the bicyclists.

Table 6. Group Response Distribution by Percentage. Concern for Bodily Harm.

| | SA | A | U | D | SD |
|---|---|---|---|---|---|
| BICYCLISTS % | 06 | 18 | 07 | 36 | 34 |
| PEDESTRIANS % | 08 | 30 | 06 | 33 | 22 |
| | CONCERNED | | | UNCONCERNED | |

Values derived from the Chi Square procedure are presented in Figure 2. Statistical results show that Statement Eight produced a p-value of .1837. This finding indicates that no significant difference existed between how bicyclists and pedestrians viewed traffic safety on campus.




Chi Square 5.21367 Significance .1837 Degrees Freedom 4

Figure 2. Chi Square Analysis and Response Distribution. The Degree of Participant Concern From a Traffic Related Injury on Campus.

Hypothesis One was retained.

Hypothesis Two

There is no significant difference between the attitudes of bicyclists and pedestrians regarding how strictly traffic regulations should be enforced on campus.

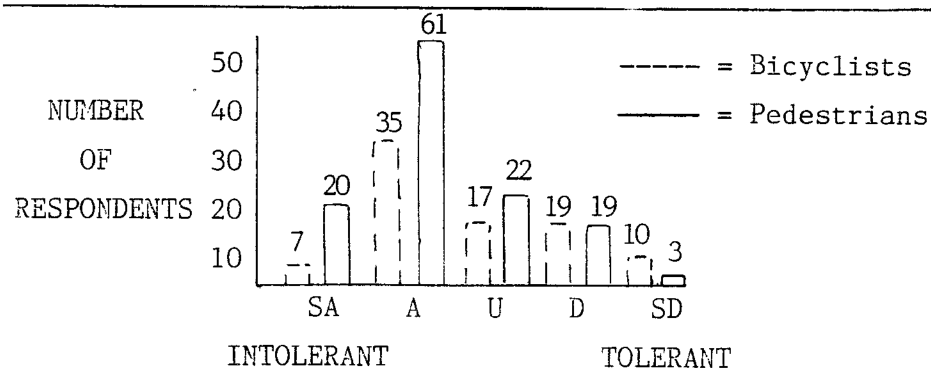
Hypothesis test, Statement Five. Violations of campus traffic regulations by bicyclists should not be tolerated.

Respondents percentage of agreement level is shown in Table 7. The stronger the agreement for this statement, the less tolerance an individual had for bicyclists violating traffic regulations. Pedestrians were clearly less tolerant of violations than were bicyclists. By combining the SA column with the A column we see that 65% of the pedestrians prefered not to tolerate bicycle traffic violations, whereas 48% of the cyclists shared this opinion.

Table 7. Group Response Distribution by Percentage. Tolerance for Violation of Bicycle Traffic Regulations.

| | SA | A | U | D | SD |
|---|---|---|---|---|---|
| BICYCLISTS % | 08 | 40 | 19 | 22 | 11 |
| PEDESTRIANS % | 16 | 49 | 18 | 15 | 02 |
| | INTOLERANT | | | TOLERANT | |

As indicated in Figure 3, bicyclists differed significantly from pedestrians on how strictly traffic regulations should be enforced.




Chi Square 11.635 Significance .0203 Degrees Freedom 4

Figure 3. Chi Square Analysis and Response Distribution. Toleration Level to Violations of Bicycle Traffic Regulations.

The p-value for Item Five is .0203, and therefore Hypothesis Two was rejected.

Hypothesis Three

> There is no significant difference between opinions of bicyclists and pedestrians regarding whether or not as much as possible is being done to ensure their safety from a traffic-related injury on campus.

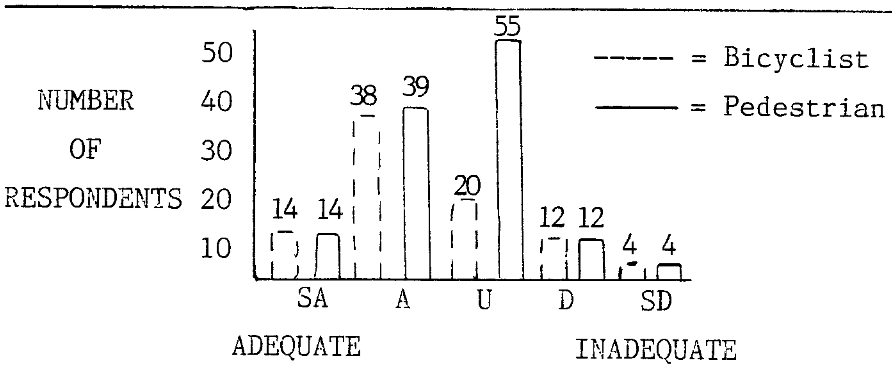
Hypothesis test, Statement Eleven. The pedestrian control program at OSU is adequate to provide for pedestrian safety.

Strong agreement with this statement would indicate that the pedestrian program was considered to be adequate on campus. It can be assumed from the data in Table 8, that the majority of respondents were satisfied with the program. By combining the disagreement columns, D and SD, it is interesting to note that 19% of the bicyclists and only 14% of the pedestrians were dissatisfied with the program.

Table 8. Group Response Distribution by Percentage. Adequacy of the Pedestrian Safety Program.

| | | SA | A | U | D | SD |
|---|---|---|---|---|---|---|
| BICYCLIST | % | 16 | 43 | 23 | 14 | 05 |
| PEDESTRIANS | % | 11 | 31 | 44 | 10 | 04 |
| | | ADEQUATE | | | INADEQUATE | |

The results of the Chi Square analysis are shown in Figure 4. The significance test provided a p-value of .0350. A significant difference existed between the bicyclist and pedestrian opinions that as much as possible is being done to ensure traffic safety on campus.




Chi Square 10.34 Significance .0350 Degrees Freedom 4

Figure 4. Chi Square Analysis and Response Distribution. Adequacy of the Campus Pedestrian Safety Program.

Because this is an attitude continuum scale those in the "U" category were considered neutral. The major difference between bicyclists and pedestrians occurred in the U or Undecided category. A majority of the pedestrians were in the U category while the bicyclists were more highly represented in both of the extremes. Therefore Hypothesis Three was rejected.

Hypothesis Four

There is no significant difference between gender, bicyclist, and pedestrian perception of campus traffic safety.

The results from the Two-way Anova used to test Hypothesis Four are graphically displayed in Figure 5.

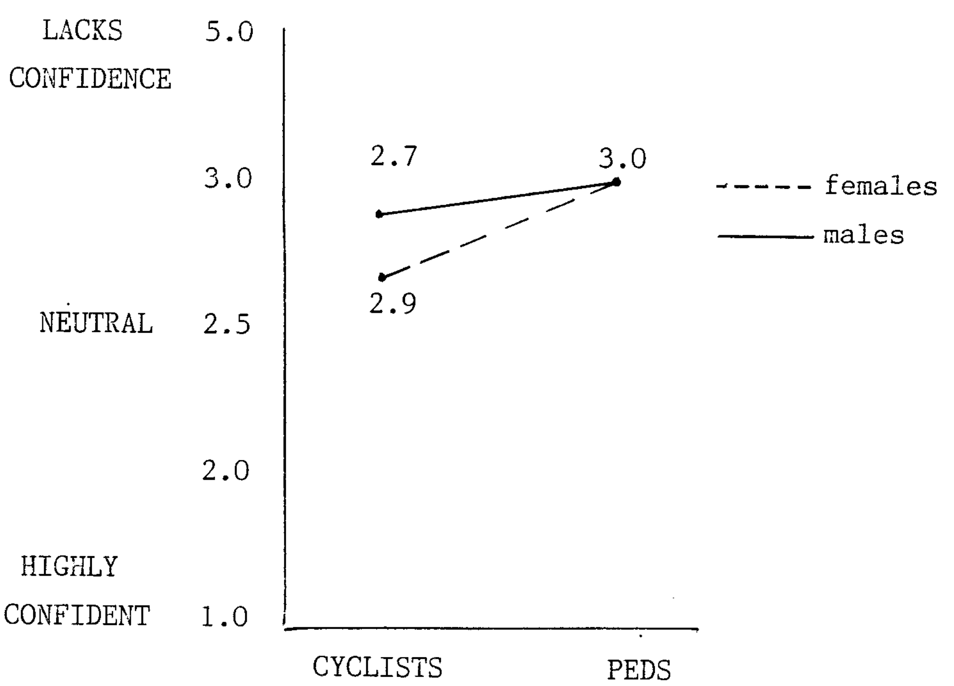



Figure 5. Instrument Mean for Female Bicyclists and Female Pedestrians and Male Bicyclists and Male Pedestrians. Level of Confidence Each Group Possesses Regarding Risk of Traffic Injury on Campus.

In viewing Figure 5, the lower mean indicated higher confidence displayed by a group in overall campus bicycle traffic safety. Figure 5 clearly shows male bicyclists to have had the highest confidence in campus traffic safety. Conversely, female pedestrians showed the lowest amount of confidence with the campus traffic system. Most notable is that the three groups male pedestrians, female pedestrians, and female bicyclists held very similar opinions. However, the male bicyclist held a much stronger positive opinion of the safety associated with campus traffic. This apparent overall interaction was not statistically significant. Hypotheses Four was retained.

## Additional Research Questions

The instrument used to perform this research contained specific statement groups that reflected one attitude dimension, for example, enforcement, regulations, and fear of injury. Answers to the research questions were obtained by grouping survey statements that shared related dimensions, then calculating the total percentage of responses for each degree within those statements. These were then added together to produce a picture of agreement or disagreement for bicyclists and pedestrians. In a fashion similar to the survey instrument, Strongly Agree (SA), represented positive feelings, and Strongly Disagree (SD), represented negative feelings.

The following four questions of related importance were answered as a result of this survey questionnaire: 1) What is the general feeling of safety from a bicycle accident while on campus? 2) Do current bike facilities affect traffic safety on campus? 3. Should restrictions be placed on bicycle travel on campus? and, 4) Are traffic regulations enforced adequately?

The following analysis will state the research question followed by the questionnaire statement(s) used to answer the question. Then the results will be discussed, and finally a table showing the distribution of responses and a figure showing the percentage of the response distribution for bicyclists and pedestrians will be provided.

Question 1. What is the general feeling of traffic safety on campus?

Statements used to measure the opinion were 6, 7, 8, and 17.

6. There are too many accidents involving pedestrians and bicyclists on campus.
7. There are too many bicycles on campus.
8. I am concerned about bodily harm from a bicycle accident while walking on campus.

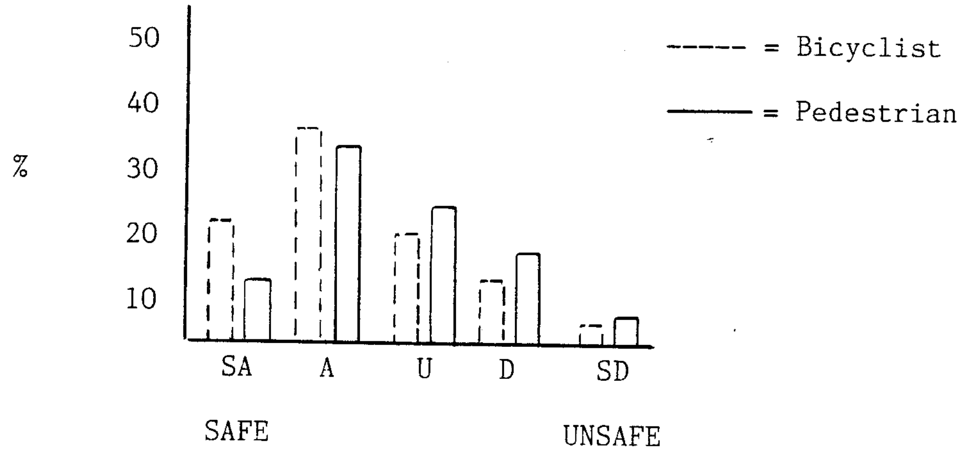
17. The number of bicycle pedestrian accidents on campus is acceptable.

In order to maintain the consistent direction of positive opinions, responses of 6, 7, and 8 were reversed as previously described. Table 9 indicates that bicyclists and pedestrians appeared to regard the overall campus safety environment as positive since only 54 subjects indicated an extremely negative view of traffic safety.

Table 9. Response Distribution by Group. Degree Participants Fear for Their Safety From a Traffic Related Injury.

| | | SAFE | | | | UNSAFE | |
|---|---|---|---|---|---|---|---|
| BICYCLISTS | | SA | A | U | D | SD | |
| | 6r | 14 | 28 | 23 | 15 | 08 | r = reverse |
| | 7r | 35 | 42 | 07 | 02 | 02 | |
| STATEMENT | 8r | 30 | 32 | 06 | 16 | 05 | |
| | 17 | 09 | 22 | 30 | 19 | 08 | |
| Total | | 88 | 124 | 66 | 52 | 23 | N = 353 |
| PEDESTRIANS | | SA | A | U | D | SD | |
| | 6r | 06 | 27 | 52 | 31 | 08 | |
| STATEMENT | 7r | 24 | 62 | 20 | 14 | 05 | |
| | 8r | 28 | 41 | 08 | 38 | 10 | |
| | 17 | 04 | 29 | 49 | 34 | 08 | |
| Total | | 62 | 159 | 129 | 117 | 31 | N = 498 |
| Total Number | | SA | A | U | D | SD | |
| Bicyclists | | 88 | 124 | 66 | 52 | 23 | |
| Pedestrians | | 62 | 159 | 129 | 117 | 31 | |

The actual percentage of distribution is shown in Figure 6. The stronger the agreement, the more positive the opinion regarding traffic safety is. When both agreement columns were combined, 59% of the bicyclists and 48% of the pedestrians viewed the traffic environment as safe. However, in combining the disagreement columns, a significant amount of disagreement emerged. Approximately 21% of the bicyclists and 26% of the pedestrians expressed high degrees of insecurity regarding their safety from a traffic-related injury on campus.




| | | | | | |
|---|---|---|---|---|---|
| Bicyclists | 22 | 37 | 20 | 15 | 06 |
| Pedestrians | 14 | 34 | 26 | 19 | 07 |

Figure 6. Statement Distribution by Group. Degree of Fear Felt by Participants of Receiving an Injury From a Traffic Accident.

Question 2. Do current bike facilities affect traffic safety on campus?

Statements used to measure that opinion were 2, 12, and 13.

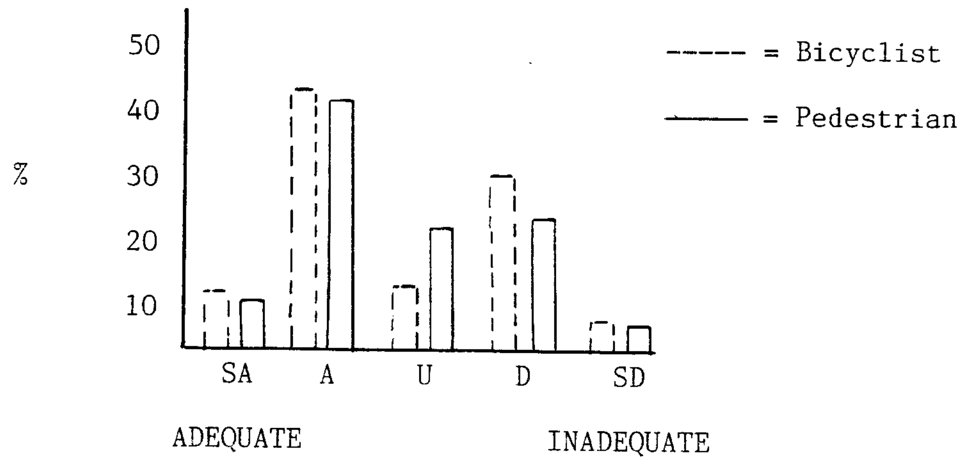
2. Bicycle parking facilities on campus are adequate.
12. Oregon State University has a problem concerning the use of bicycles on campus.
13. Campus street conditions are favorable to promote safe bicycling.

To maintain the proper direction of agreement, responses to Statement 12 were reversed. Table 10, shows the actual number of subjects and how they were distributed on the agreement scale. Strong Agreement (SA), with this question indicated that facilities did not have an adverse effect on traffic safety. However, in examining the statements separately approximately 46% of the bicyclists indicated facilities are inadequate. Approximately 20% of the pedestrians felt that facilities were inadequate.

Table 10. Response Distribution by Group. Perceived Adequacy of Campus Bicycle Facilities.

| | | ADEQUATE | | | INADEQUATE | | |
|---|---|---|---|---|---|---|---|
| BICYCLISTS | | SA | A | U | D | SD | |
| | 2 | 06 | 36 | 06 | 31 | 10 | |
| STATEMENT | 12r | 15 | 37 | 14 | 21 | 01 | r = reverse |
| | 13 | 08 | 41 | 12 | 25 | 03 | |
| Total | | 29 | 114 | 32 | 77 | 14 | N = 266 |
| PEDESTRIANS | | SA | A | U | D | SD | |
| | 2 | 16 | 56 | 27 | 19 | 06 | |
| STATEMENT | 12r | 12 | 42 | 33 | 34 | 04 | |
| | 13 | 09 | 61 | 21 | 27 | 07 | |
| Total | | 37 | 159 | 81 | 80 | 17 | N = 374 |
| Total Number | | | | | | | |
| Bicyclists | | 29 | 114 | 32 | 77 | 14 | |
| Pedestrians | | 37 | 159 | 81 | 80 | 17 | |

Figure 7 graphically displays this distribution. It is interesting to note the small number of bicyclists that selected the "U" category which is neutral. This indicated that for some reason the bicyclist group had a highly different opinion from the pedestrian group.




| Total % | | | | | |
|---|---|---|---|---|---|
| Bicyclists | 11 | 43 | 12 | 29 | 05 |
| Pedestrians | 10 | 42 | 21 | 22 | 05 |

Figure 7. Statement Distribution by Group. Adequacy of Campus Bicycle Facilities.

Question 3. Should restrictions be placed on campus bicycle travel?

Statements used to measure that opinion were 9, 15, and 18.

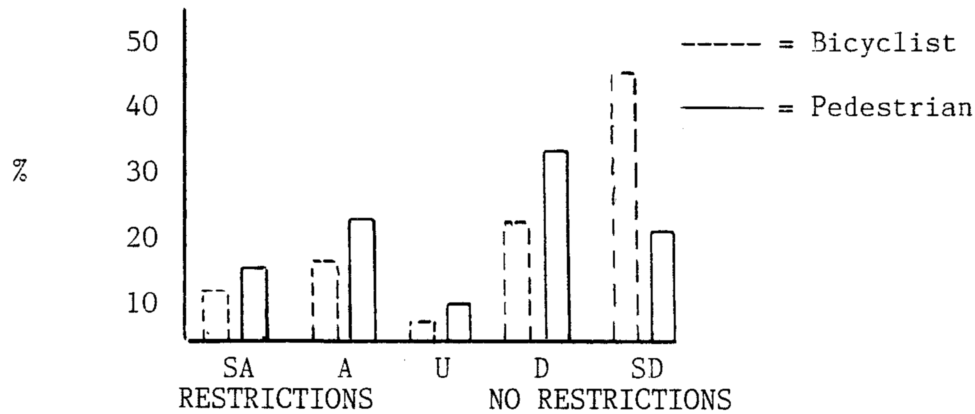
9. Bicyclists should be allowed to ride on all campus sidewalks.
15. Bicycle riding on campus should be restricted to certain hours.
18. Cyclists should be restricted to parking only within centralized parking facilities.

In order to combine similar degrees, the responses to Statement 9 were reversed. Again, both groups appeared to hold similar opinions regarding restrictions on bicycle activities as shown in Table 11. Strong agreement with this question indicated that selected restrictions should be used on campus. This was a sensitive area with both groups displaying strong opinions (note the low rate of response in the Undecided category). The most significant difference was in the SD category with the majority of bicyclists located there.

Table 11. Response Distribution by Group. Degree to Which Restrictions on Bicycle Travel Should be Applied.

| | | RESTRICTIONS | | | NO RESTRICTIONS | | |
|---|---|---|---|---|---|---|---|
| BICYCLISTS | | SA | A | U | D | SD | |
| | 9r | 26 | 36 | 06 | 14 | 07 | r = reverse |
| STATEMENT | 15 | 00 | 01 | 00 | 15 | 73 | |
| | 18 | 03 | 09 | 08 | 30 | 38 | |
| Total | | 29 | 46 | 14 | 59 | 118 | N = 266 |
| PEDESTRIANS | | SA | A | U | D | SD | |
| | 9r | 54 | 44 | 14 | 12 | 01 | |
| STATEMENT | 15 | 02 | 04 | 05 | 58 | 55 | |
| | 18 | 04 | 35 | 15 | 51 | 20 | |
| Total | | 60 | 83 | 34 | 121 | 76 | N = 374 |
| Total Number | | | | | | | |
| Bicyclists | | 29 | 46 | 14 | 59 | 118 | |
| Pedestrians | | 60 | 83 | 34 | 121 | 76 | |

Combining the responses of agreement shows that 38% of the pedestrians favored some form of restriction while 28% of the bicyclists hold this conviction. This is evident from the information presented in Figure 8. In looking at individual statements within Question 4, Statement 9, which deals with riding bicycles on sidewalks, one sees that 69% of the bicyclists and 78% of the pedestrians felt bicyclists should not be allowed on sidewalks. Statement 18 which deals with centralized bicycle parking shows that 31% of the pedestrians and 13% of the bicyclists favored centralized bike parking facilities.




Total %

| | | | | | |
|---|---|---|---|---|---|
| Bicyclists | 11 | 17 | 05 | 22 | 44 |
| Pedestrians | 16 | 22 | 09 | 32 | 20 |

Figure 8. Statement Distribution by Group. Degree that Restrictions Should be Placed on Campus Bicycle Travel.

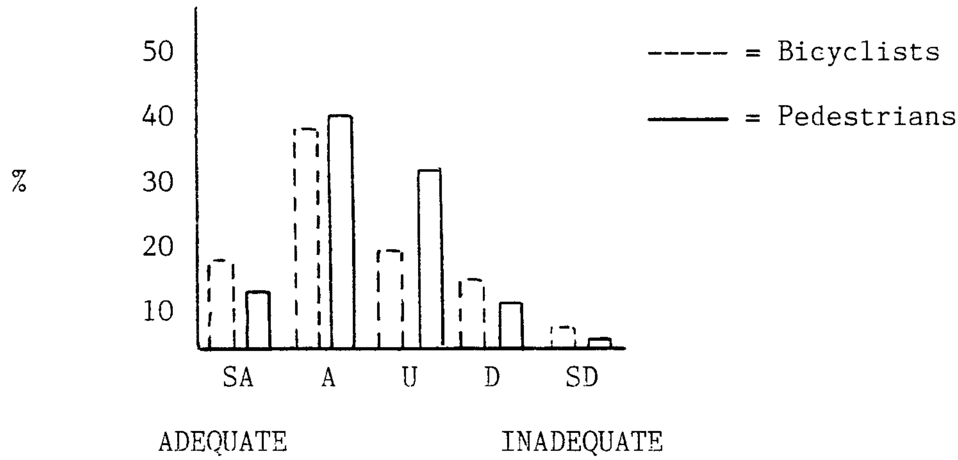
Question 4. Are traffic regulations enforced adequately? Statements used to measure this opinion were 1 and 11.

1. Enforcement of bicycle regulations on campus is adequate.
11. The pedestrian control program on campus is adequate to provide for pedestrian safety.

Table 12, and Figure 9, display data that is almost identical for both groups. Strong agreement with these questions indicates satisfaction with current enforcement and pedestrian safety programs. However, it should be noted in Figure 8, that bicylists were 16% more confident in the pedestrian safety program than were pedestrians.

Table 12. Response Distribution by Group. Level of Enforcement Thought Necessary for Traffic Regulations.

| | | ADEQUATE | | | INADEQUATE | |
|---|---|---|---|---|---|---|
| BICYCLISTS | | SA | A | U | D | SD | |
| STATEMENT | 1 | 19 | 34 | 15 | 14 | 05 | |
| | 11 | 14 | 38 | 20 | 12 | 04 | |
| Total | | 33 | 82 | 35 | 26 | 09 | N = 185 |
| PEDESTRIANS | | SA | A | U | D | SD | |
| STATEMENT | 1 | 22 | 60 | 22 | 17 | 03 | |
| | 11 | 14 | 39 | 55 | 12 | 05 | |
| Total | | 36 | 99 | 77 | 29 | 08 | N = 249 |
| Number | | | | | | | |
| Bicyclists | | 33 | 82 | 35 | 26 | 09 | |
| Pedestrians | | 36 | 99 | 77 | 29 | 08 | |




| Total % | | | | | |
|---|---|---|---|---|---|
| Bicyclist | 19 | 39 | 20 | 15 | 06 |
| Pedestrian | 15 | 40 | 31 | 12 | 03 |

Figure 9. Response Distribution by Group. Adequacy of the Current Level of Bicycle Traffic Regulation Enforcement.

Individual evaluation of these statements reveals similar information. A slight exception occurs for Statement 1. When combining both disagreement columns, approximately 21% of the bicyclists compared to 15% of the pedestrians felt that enforcement of bicycle regulations on campus was not adequate.

In addition to the above findings, certain conclusions can be drawn from the individual statements and participants' remarks. Survey Statement 6: There are too many traffic accidents involving bicyclists and pedestrians, evoked a predictable response from participants. This was evident in that 35% of those surveyed marked the Undecided category which is neutral. One reason for this could be that most respondents were not aware of the accident rate. However, using information supplied by respondents, the following statistics were developed. In a 12-month period, the average student pedestrian would have a 4% chance of being involved in an accident with a bicycle. In that period, the same student would have an 88% chance of witnessing at least one accident between a bicyclist and a pedestrian.

Statement 7: There are too many bicycles on campus, met with heavy disagreement from both bicyclists and pedestrians. It was widely felt that bicycling should be encouraged; however, a review of participant's remarks indicated that they felt bicycling was discouraged by the university administration. Interestingly, 30% of all students polled admitted they felt there was a problem concerning bicycles on campus.

The section containing participants' remarks provided more data about the study group. Arbitrary administrative bicycle regulations was a source of complaint among students. Bicycle facilities, for example, poorly maintained road surfaces, lack of bicycle storage facilities, and few dedicated bike routes were mentioned. Approximately 95% of all respondents agreed that bicycle riding on campus should not be restricted to certain hours. However, the remarks indicated opinions that favored closing designated streets to bike travel between class change or completely prohibiting bicycle travel on the campus interior. Furthermore, 24% of the respondents were receptive to the idea of centralized bicycle parking.

## Summary

The results of hypotheses testing were presented in this chapter. The testing required data to be analyzed for 214 subjects. Hypotheses One, Two, and Three were tested utilizing Chi Square, and Hypothesis Four was tested utilizing a two-way Anova. Two significant findings emerged from hypotheses testing: 1) bicyclists and pedestrians had a difference of opinion concerning the amount of effort being put forth to ensure their safety on campus from a traffic accident, and 2) pedestrians endorsed stricter adherance to traffic regulations than did bicyclists. There was no difference between bicyclist and pedestrian feelings of security regarding injury from a traffic accident on campus. Finally, there was no significant gender effect on perception of campus traffic safety. Hypotheses were tested at the .05 level of significance.

The additional research questions revealed that both bicyclists and pedestrians showed similarities in all dimensions tested. Approximately 75% of the bicyclists and 54% of the pedestrians held similar opinions that the campus traffic environment was safe from traffic-related injury. The statement regarding restrictions on riding bicycles provided the most discrimination with only 14% of all subjects selecting the Undecided category. However, 38% of the pedestrians and 28% of the cyclists supported some type of restrictions on bicycle traffic. Finally, the majority of participants perceived regulations as enforced adequately.

# V: CONCLUSIONS AND RECOMMENDATIONS

This research investigated opinions of university students regarding their perception of safety from bicycle traffic accidents while on campus. This was accomplished by submitting a survey of Traffic Safety Opinions to 300 Oregon State University students. The instrument consisted of 19 statements and 10 biographical questions. In addition, the survey requested remarks concerning campus traffic safety.

This chapter will be divided into two parts. First the conclusions will be summarized based on data analysis and participants' remarks. Second, Recommendations will be provided in the following areas: 1) regulations, 2) enforcement, 3) general problems, and 4) recommendations for future research.

## Conclusions

Analysis of the results of this research provided the following conclusions:

1. There are differing degrees of concern regarding risk of traffic-related injury. The following differing concern regarding risk of bicycle traffic-related injury emerged:

   a. Male bicyclists felt the least risk of injury from a bicycle/pedestrian accident on campus.

   b. Female pedestrians felt the most risk of injury from a bicycle/pedestrian accident on campus.

Similar comparisons have been made with comparable results (NSC, 1985). For youths 15 to 24 years old, all kinds of accidents claim more lives than all other causes combined, and account for about four times more than the next leading cause of death. Four out of five accident victims in this age group are males.

2. Approximately 30% of all subjects felt there was a problem of interaction between bicyclists and pedestrians at OSU. However, 75% of this study group felt bicycling should be encouraged.

3. Approximately 46% of the pedestrians and 25% of the bicyclists felt at risk of sustaining a traffic-related injury on campus. The chief complaint against bicyclists concerned riding of their bicycles on sidewalks. Complaints in regard to pedestrians concerned inattentiveness and entering the roadway without doing a visual search for traffic.

4. Approximately 38% of the pedestrians and 28% of the bicyclists supported some form of bicycle traffic restrictions. Restrictions included limiting travel to specified periods, designated off-limit streets for bicycles, and no bicycles on the sidewalks unless being walked.

5. Pedestrians endorsed stricter adherance to traffic regulations than did bicyclists. Both groups recognized the need for conformance to regulations; however they also felt that current enforcement levels were adequate and that police powers were used to excess.

6. Pedestrians felt less was being done to ensure traffic safety on campus than did bicyclists. This coincided with the opinion that pedestrians most risked bodily harm from a bicycle traffic accident on campus.

The following additional conclusions were drawn by the researcher as a result of analyzing participants' remarks:

7. Development of traffic regulations should be done by the campus bicyclists and pedestrians.

8. Regulations are not consistently enforced.

9. Regulations and their enforcement are excessively prohibitive.

10. Bicycle facilities are grossly inadequate.

The accident rate for bicyclists and pedestrians on campus is difficult to establish. This is due to the lack of data regarding bicyclist and pedestrian miles traveled, and the lack of accident records. However, 37% of those surveyed witnessed one or more accidents involving a bicyclist and pedestrian for a total of 180 accidents. This translates into an 88% probability that an individual will witness at least one accident on campus in a twelve month period.

## Recommendations

Regulations. Currently, campus police are responsible for development of traffic regulations. As with most regulatory agencies, campus police are burdened with administering too many regulations. Some of these regulations are implemented as the result of administrative over-reactions, for example, riding without hands on the handlebars. The first recommendations this paper will make is the formation of a student Traffic Safety Review Board. Some of the Board duties would be to

1. Abolish all current bicycle traffic regulations,
2. Formulate new objective regulations,
3. Oversee regulation enforcement activities,
4. Interact with campus security to provide recommendations designed to meet student needs,
5. In cooperation with the College of Education, develop traffic safety educational programs, and
6. Establish and control program budgetary items.

The board should consist of members who will be affected by its' legislation. Members should be actively solicited and should not be solely volunteers. Membership might consist of

1. The Bicycle Club captain,
2. A student at large,
3. A physically handicapped individual, and
4. A student health representative.

As mentioned earlier, female pedestrians felt most insecure with campus traffic safety. This group should be well represented on the Board.

Regulation signs should be posted at all university entrances. Sidewalk surface signs similar to those used at the University of Oregon should be stenciled on all sidewalks. The media should be used to disseminate information and encourage peer pressure for conformance to regulations. Traffic safety education programs for bicyclists and pedestrians should be evaluated and implemented.

<u>Enforcement.</u> The chief complaints here were that regulations are inconsistently enforced and that enforcement officers did not identify with the needs of the general population. The possibility of the officers coming into contact with hardened criminals in a campus environment is remote. The "Big Trooper" attitude should be discouraged as the method for handling student

infractions.

This research recommends the use of a "Bicycle Force" staffed by work-study students. It would be the objective of the Force to discourage traffic violations. It would send a representative to the Traffic Safety Board.

General Problems. This category will embrace all other participant remarks, specifically, participant opinions regarding bicyclists, pedestrians, and the availability of bicycle facilities.

Extensive previous research has concentrated on pedestrian habits (Singer, 1964; Reading, 1973; Preston, 1980). These studies concluded that pedestrians were responsible for the majority of nonmotorized vehicle accidents. The pedestrian's lack of training, failure to perform adequate visual searches, and general inattentiveness were cited as accident causation factors. Cross (1979) credited the combined bicyclist/pedestrian path for an increase in accidents involving these two groups. This was due, almost exclusively, to the unpredictable rapid change in direction of pedestrians.

It is beyond the scope of this paper to develop safety training programs for bicyclists and pedestrians. However, the research has exposed some problems and suggested some remedies. This research recommends the following:

1. Establishment of dedicated bike thoroughfares across campus, terminating in secure bike storage areas,
2. Location of storage areas located on the perimeter of the campus,
3. Provision of a limited number of bicycle storage lockers on an experimental basis.

Future Research. The results of this study may provide background data for subsequent research into campus traffic safety. The following areas should be explored:

1. Development of traffic safety education programs aimed at altering attitudes of males,
2. Development of procedures for recording bicyclist/pedestrian accidents,
3. Development of enforcement tools by exploring progressive techniques,
4. Development of a centralized bike storage plan,
5. Analysis of the heterogenity of municipal ordinances for bicyclists and pedestrians,
6. Development of techniques designed to modify bicycle traffic safety attitudes.

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# APPENDICES

# APPENDIX A

# THE SURVEY INSTRUMENT

WHAT IS YOUR OPINION ?

SURVEY QUESTIONNAIRE

This survey is designed to identify the attitudes of pedestrians and bicyclists regarding their safety from accidents with each other on campus. Please answer all questions. Your confidentiality will be maintained by the researchers using this data.

1. Listed below are some statements concerning your opinion of pedestrian and bicyclist activities on campus. Please indicate to what degree you agree or disagree with each statement by circling the corresponding number.

| | STATEMENT | STRONGLY AGREE | AGREE | UNDECIDED | DISAGREE | STRONGLY DISAGREE |
|---|---|---|---|---|---|---|
| a. | Enforcement of bicycle regulations on campus is adequate......................... | 1 | 2 | 3 | 4 | 5 |
| b. | Bicycle parking facilities on campus are adequate........... | 1 | 2 | 3 | 4 | 5 |
| c. | Bicyclists should be allowed to ride only on selected campus sidewalks................. | 1 | 2 | 3 | 4 | 5 |
| d. | Pedestrians walking the campus at night should wear bright colored or reflective clothing......................... | 1 | 2 | 3 | 4 | 5 |
| e. | Violations of campus traffic regulations by bicyclists should not be tolerated.......... | 1 | 2 | 3 | 4 | 5 |
| f. | There are too many accidents involving pedestrians and bicyclists on OSU Campus......... | 1 | 2 | 3 | 4 | 5 |
| g. | There are too many bicycles on campus........................ | 1 | 2 | 3 | 4 | 5 |
| h. | I am concerned about bodily harm from a bicycle accident when walking on campus.. | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| i. | Bicyclists should be allowed to ride on all campus sidewalks..... | 1 | 2 | 3 | 4 | 5 |
| j. | Violations of campus traffic regulations by pedestrians should not be tolerated.......... | 1 | 2 | 3 | 4 | 5 |
| k. | The pedestrian control program at OSU is adequate to provide for pedestrian safety.... | 1 | 2 | 3 | 4 | 5 |
| l. | Oregon State University has a problem concerning the use of bicycles on campus............ | 1 | 2 | 3 | 4 | 5 |
| m. | Campus street conditions are favorable to promote safe bicycling........................ | 1 | 2 | 3 | 4 | 5 |
| n. | The majority of the cyclist population is familiar with bicycle traffic regulations...... | 1 | 2 | 3 | 4 | 5 |
| o. | Bicycle riding on campus should be restricted to certain hours... | 1 | 2 | 3 | 4 | 5 |
| p. | Bicyclists are not aware of traffic regulations on campus.... | 1 | 2 | 3 | 4 | 5 |
| q. | The number of pedestrian/ bicyclist accidents on the OSU campus is acceptable............ | 1 | 2 | 3 | 4 | 5 |
| r. | Cyclists should be resricted to parking only within centralized parking facilities............... | 1 | 2 | 3 | 4 | 5 |
| s. | Bicycle speed limits on campus should be the same as that for vehicles................ | 1 | 2 | 3 | 4 | 5 |

The following questions are designed to allow the researchers to make comparisons between groups of respondents. Your answer to each question is vital.

2. Do you ride a bicycle? (Circle one number)
   1 YES
   2 NO

   2a. Do you usually ride your bike on campus at least three times per month? (Circle one number)
      1 YES, AT LEAST THREE TIMES PER MONTH.
      2 NO (skip to question 4).

   2b. When you ride, about how many miles do you travel on your bike? (Enter a number)
      MILES PER WEEK

   2c. What is the frame size of your bike? (Circle one number)
      1 22 INCHES
      2 24 INCHES
      3 26 INCHES
      4 28 INCHES
      5__ OTHER (please specify)

3. Have you had an accident on campus within the past 12 months? (Circle one number)
   1 NO (Go to question 4)
   2 YES (Go to question 3a)

   3a. Please indicate how many accidents you have had on campus during the last 12 months. (Write in the number)

   3b. How serious was your most recent accident? (Circle the best answer)

      1 BIKE DAMAGE ONLY, NO PERSONAL INJURY
      2 MINOR SCRAPES AND BRUISES
      3 REQUIRED EMERGENCY ROOM OR DOCTOR'S CARE
      4 OVERNIGHT HOSPITAL STAY OR ON-GOING CARE
      5 OTHER (please specify)____________________

   3c. In your most recent accident did you collide with: (Circle the number of the best answer)

      1 A MOVING MOTOR VEHICLE
      2 A STATIONARY MOTOR VEHICLE
      3 ANOTHER BICYCLE
      4 A PEDESTRIAN
      5 OTHER (Please specify). ____________________

4. Judging from your own experiences how many bicycle/pedestrian accidents would you say occur on the OSU campus in a 12 week term, if any. (Circle a number)
   1 NONE
   2 1 TO 5 PER WEEK
   3 6 TO 10 PER WEEK
   4 11 TO 15 PER WEEK
   5 OTHER (Please specify) ____________________

5. During the last 12 months how many acccidents have you been involved in with a bicycle as: (Enter the amount in the right category/ies)
   ____ A PEDESTRIAN
   ____ A WITNESS

6. How many terms have you attended classes at the OSU Campus? (Circle the proper number)
   1 THIS IS THE FIRST TERM
   2 1 TO 3 TERMS
   3 4 TO 6 TERMS
   4 6 TO 12 TERMS
   5 OTHER (Please specify)____________________

7. Would you please give your approximate height and weight? (Circle one number for each)

| | WEIGHT | | HEIGHT |
|---|---|---|---|
| 1 | 100-110 POUNDS | 1 | LESS THAN 5 FEET |
| 2 | 110-130 POUNDS | 2 | 5 FEET TO 5 FEET 3 INCHES |
| 3 | 130-150 POUNDS | 3 | 5 FEET 3 INCHES TO 5 FEET 6 INCHES |
| 4 | 150-180 POUNDS | 4 | 5 FEET 6 INCHES TO 5 FEET 9 INCHES |
| 5 | 180-210 POUNDS | 5 | 5 FEET 9 INCHES TO 6 FEET |
| 6 | OTHER ____ | 6 | OTHER (Please specify) ________ |

8. Are you, (Please circle a number, and write in your age.)
   1 MALE AGE ______
   2 FEMALE AGE ______

9. Do you wear glasses or contact lenses? (Circle a number.)
   1 YES
   2 NO

10. If you have any physical disabilities please describe them.

____________________ ______ ________________

Please write any comments you have about this survey or pedestrian/cyclist conditions on the last pages of this form. Please return this survey as soon as possible.

Thank you for participating in this survey. The results could provide us with a safer campus environment.

# APPENDIX B

## COVER LETTERS TO PARTICIPANTS

November 4, 1985

Department of Health Oregon State University Corvallis, Oregon 97331-6406 (503) 754-2686

Dear

I am currently involved in a graduate research project that will identify how bicyclists/pedestrians perceive the safety climate on campus. Would you please participate in a Delphi Process to validate the instrument?

Enclosed are samples of the cover letter and the pre-test survey instrument. The instrument to be used in the actual survey will consist of 20 Likert-type statements and demographic questions.

The survey will be sent to two random groups, pedestrians and bicyclists, from a university campus. Some of the objectives of the survey are to identify the following attitudes:

1. Are pedestrian/cyclist regulations enforced adequately to provide pedestrian/cyclist safety?
2. Do current bike parking facilities encourage unsafe cyclist behavior?
3. Do pedestrians/cyclists feel more could be done to ensure their safety on campus?
4. What is the general feeling of commuter safety on campus?
5. Should prohibitions be place on bicycle travel on campus?

I would appreciate your participation in reviewing the enclosed letter and survey for content and format, as well as completing the survey. Indicate whether you feel a statement should be, "Accepted, Modified, or Rejected", and your alternate form if you choose "Modified". You may write your suggestions along with the identity of the question you are referencing on a separate sheet of paper. Please return your suggestions and the completed survey in the enclosed, pre-stamped envelope as soon as possible. All recommendations will be evaluated and the final round will be resubmitted to you.

Your participation in this modified Delphi Panel will be appreciated. If you would like a copy of the results, please indicate so on your comment sheet and you will receive it at the completion of the study.

I would be most happy to answer any questions you might have. Please write or call, (503)757-9031.

Thank you for your assistance.

Sincerely,

Gary W. Tuyls

Department of Health Oregon State University Corvallis, Oregon 97331-6406 (503) 754-2586

November 4, 1985

Dear

In the past few years, various programs that affect bicyclists and pedestrians have been implemented on Oregon State University Campus (OSU). Some of these programs have involved increases in student fees and all have involved our safety and security.

Your name is one of a small group selected to participate in this survey of opinions of bicyclist/pedestrian safety on campus. It was drawn from a random sample of the entire University population. In order that the results will truly represent the attitude of all OSU students/faculty, it is important that each questionaire be completed and returned.

You may be assured of complete confidentiality. The questionaire has an identification number for mailing purposes only. This is so we may check your name off the mailing list when your questionaire is returned. Your name will not be placed on this questionaire.

The results of this research will be made available to officials, reperesentatives on campus safety committees, and all interested citizens. You may receive a summary of results by writing "copy of results requested" on the back of the return envelope, and printing your name and address below it. Please do not put this information on the questionaire itself.

I would be most happy to answer any questions you might have. Please write or call. The telephone number is (503)754-3289.

Thank you for your assistance.

Sincerely,

Gary W. Tuyls

February 13, 1986

Department of Health Oregon State University Corvallis, Oregon 97331-6406 (503) 754-2686

About three weeks ago we wrote to you seeking your opinion on how you perceived your safety as a pedestrian/cyclist on campus. As of today we have not yet received your completed questionnaire.

This research was undertaken with the belief that a safety program should take into account the opinions of those people affected by it. This makes for a more viable and widely accepted program.

I am writing to you again because of the significance each questionnaire has to the usefulness of this study. Your name was selected through a scientific sampling process in which every registered student on OSU Campus had an equal chance of being selected. This means that only about one out of every 50 students is being asked to complete this questionnaire. In order for the results of this study to be truly representative of the opinions of all students it is essential that each person in the sample return their questionnaire.

In the event your questionnaire has been misplaced, a replacement and return envelope is enclosed.

Your cooperation is greatly appreciated.

Cordially,
*Redacted for Privacy*

Gary Tuyls
Study Director

P.S. Several study participants have written to ask when the results of the study will be available. We hope to have them ready by April.

# APPENDIX C

# PARTICIPANTS' REMARKS

REMARKS ABOUT REGISTRATION

Riding on campus doesn't need to be regulated or charged for.

I don't like to pay for a bicycle liscense because if someone steals your bike the first thing they'll do is tear the sticker off.

I'm against the licensing, but I understand the need.

Drop registration fees, why are they needed?

I think the bike tickets and registration is stupid, I want it abolished!

I don't agree with buying bicycle stickers. You shouldn't have to pay to park your bike.

Charging a fee for riding a bike on campus will not make people safe, having security chase down people without permits is a gross mismanagement of security dollars.

REMARKS ABOUT REGULATIONS

Traffic regulations should be enforced more strictly.

Current issues, such as riding with out hands, are very significant.

It is also my opinion that some of the regulations are over enforced. If riders are blatantly endangering pedestrians a citation should be issued. Riding onto a sidewalk to park ones' bicycle seems harmless enough.

As for riding on sidewalks, instead of making a cut and dry law where one can get a ticket for just riding up on the sidewalk to the bike racks, a distance of 3 maybe 4 feet.

I also feel this bike riding without hands on the handle bars is another dumb law with an overblown punishment. It should be up to the riders discretion with punishment only when an accident happens resulting in injury to another biker or pedestrian.

I also feel the $119. fine for riding without hands is absurd, although I do feel that it is very unwise to ride with out your hands on the handlebars.

If they do close the campus to all traffic including bicycles inbetween classes I will be furious and someone will be hearing from me.

It's unfair to make restrictions on cyclists or peds by unreasonable regulation, e.g.,be allowed to ride only on selected campus sidewalks, or peds should wear bright clothing.

I think the bike laws are !!!!. We are grown up enough to know how to ride bikes like normal humans. I hate riding on campus and having to worry about the cops giving me a ticket.

I believe students should be better informed on bicyclist regulations on campus.

I think if everybody can follow the regulation we now have, it's enough.

I think the regulations that would give a cyclist riding with out hands a $119 ticket and a careless driving charge put on his permanent driving record is both obscene and absurd! A ticket that would not be part of ones driving record and a $5 fine would be more reasonable and sensible approach.

ENFORCEMENT

I feel the law enforcement on cyclist is much too strict on this campus. The auto law enforcement is also too strict. We need to stop this gestapo type law enforcement.

Enforcement here is a farce, and should not be done unless they, (security), can learn moderation.

I think it is wrong for campus security to give tickets for parking a bike outside of the bike rack if the rack is full!

We don't need more campus security oppression.

I don't think that bike riding should be under preventative laws, its unfair and unjust more times than not.
I don't think we need a radar gun to catch a bicyclist speeding.

If what I have heard about getting a radar gun to catch speeding bicycles is true, then I am really upset. I feel that this is absurd to spend time and money to try to catch speeding bicyclists. From my observations most bicyclists couldn't even break the speed limit if they wanted to.
Questions dealing with the level of enforcement of bicycle regulations perhaps may be misleading. While I agree that cyclists should be more cognizant of rules governing the flow of traffic, peds too, I and others resent the way the campus police handle enforcement. I therefore disagree with increased enforcement.

I feel security is too strict on bicycles, i.e. ticketing for riding on sidewalk to park bike, etc. They could spend more time doing something useful instead of writing hundreds of tickets.

I don't see any reason for giving parking tickets to people without a bicycle parking permit.

GENERAL STATEMENTS

Put traffic lights at the intersections on campus. To me these are the most dangerous places between classes.

Campus street conditions are terrible: potholes, patched asphalt, gravel, leaves, etc.

Bikes should have there place too, just like cars.

I would be glad to rent a locker for my bike if they were available.

I don't think there is a bike accident problem on campus.

Riding with no hands is not a problem, a cyclist adjusts to their situation, at times hands are needed and other times not.

An experienced, confident bike rider not going by every traffic regulation is still safer than an inexperienced,frightened rider trying to follow every rule. This doesn't mean I disagree with traffic regulations.

Bicycles should be encouraged as alternatives to autos on campus.

If people would watch where they are going, and look out for others there would be no accidents.

The accident I witnessed involved two Asians not paying attention.

Accidents are mostly happening during class breaks since both bicyclists & pedestrians are hurrying to their classes. So something must be done to this.

Bicycles on sidewalks are the greatest hazard.

I feel very vulnerable as a pedestrian on campus.

I feel that the time and money spent on this issue including newspaper space, paper for the survey, the money for bicycle permits, taking up valuable time, and the overall inflammation of this topic are purely !!!!!!!!. Lets see some truely progressive action being made for the students, it seems that education, the main reason most of us are here, is being put second rather that first where it should be.

I enjoy biking for recreation as well as getting around campus. I feel that there are many irresponsible cyclists (as well as bozo pedestrians), out there at OSU. Personally, if some jerk mows me down, he better break both of my legs, because if I'm able, I will probably kick his head in.

I find it unusual that the only accidents or hazardous events are those who are Chinese. I believe that these minorities should be made aware of the safety rules and regs when they enroll at OSU. THANKS

God Bless!

I think the bicycle situation on campus is largely overblown.

Many times, especially during classes, bike riding on sidewalks would be very safe. If a bike rider is dumb enough to ride into a crowd and hit someone, then let campus security step in.

No lights at night is good.

Both peds & cyclists should be aware of each other and keep to their respective areas, sidewalks and streets.

OSU has a mild bicycle problem. Pedestrians are as much to blame as bikes. Don't worry too much about the problem.

I think the most of accidents are due to carelessness.
Although I've never been in an actual collision, it seems like there was a near miss almost every time I was on campus - mostly due either to cyclists running stop signs or pedestrians stepping into a street without looking.

The campus police should find a city to dump all of their !!!! on, cause I'm sick of the tickets and their general Big Trooper attitude.

SOLUTIONS

I would like to see major bike parking areas on the edge of campus, with cycling prohibited on campus during specific hours. This is idealistic and in conflict with many cyclists but I just feel that students don't need to ride their bikes from building to building. The ten minute break between classes is long enough for walking from classes.

Cyclists should look out for peds and vice-versa.

Have the perimeter of campus for car & bike traffic. The interior of campus should be for foot traffic only - no bicycles. The area is too confined and crowded for both cyclists & peds.

Close Campus Way from 14th to the Mall & close College Drive & Waldo Place.

Better bus service might cut down on the number of bikes and cars also.

More parking facilities should be provided for bicycles.

Awareness is generally the only problem. People on both sides of the issue need to pay more attention to each other.

Sometimes I think a street is too crowded to have both pedestrians and bicyclists, so pedestrians should be restricted from walking down the streets and bicyclists should be restricted from riding on the sidewalks.

Why don't you leave riding on sidewalks up to the discretion of the rider?

Bicycle parking is really a problem on campus during good weather there needs to be more racks.

People need to exercise some common sense rather than more regulations.

I think people need to be educated on the finer art of living on campus. Maybe a campaign like the ski resorts: Be aware - ski with care, only in our case. Be aware - walk with care.

Would be helpful if they (bicyclists) are behind a person to say, On your left, or, On your right, when passing a pedestrian.

More bicycle parking areas are needed.

The safety with pedestrians and bicyclists is a problem because of inattentiveness on both parties. The bicyclist especially need to slow down and pay attention.

The number of parking spaces for bikes is ridiculously nominal. The security enjoy giving tickets if your bike isn't properly locked up - but theres no place to lock it.

Maybe cyclists should be required to use bike bells to alert pedestrians of their presence.

QUESTIONNAIRE

Some of the questions on this survey can't be answered by those of us who have no information on the statistics of accidents, both reported & estimated unreported, questions a, f, and q. Ambiguous questions, i.e. e,j, and k are difficult to answer, such as what exactly is pedestrian control?

Care should be taken to not write closed or leading questions, e.g., question e. I don't want the rules abolished, however I don't want a police officer running around giving out citations for walking across the street in the wrong place or other minor bike infractions.

I beleive some of the qustions might be misleading in the way that people may have two different opinions yet would answer the question the same way, e.g., question s, "Bicycle speed limits on campus should be the same as that for vehicles." If Q s. was answered as disagree or strongly disagree it would represent contrasting opinions since one person might feel that speed limits should be lower and another feels the limit should be higher. I hope you realize that questions like that one can't be considered valid because of the contrasting views.

For a graduate student in Health, you've done a good job with this questionnaire. No insult intended. There's just a lot of saps around who can't construct and carry out a decent survey project. Good luck

Asking if accidents are "acceptable" seems a little callous - its a silly question! No number is acceptable since real humans are involved & hurt; that is not to say that they are avoidable.