

[LOG 17] A STUDY OF CYCLING INTENTION AMONG UNIVERSITI UTARA MALAYSIA STUDENTS

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ABSTRACT

Recently, the fast growing trend in the logistics industry causes the concern towards the green transportation arises from the society. Universiti Utara Malaysia (UUM), which having a 1061 hectares campus, would requires sufficient transportation for students to travel around the campus. The main mode of transportation provides by UUM management is buses. However, the shuttle bus services cannot fulfil the huge demand of students. So, many of the students prefer to drive their own private vehicles rather than using shuttle bus in campus. This would increase the carbon footprint and rate of accidents happened. In order to maintain the green environment, cycling behavior should be encourage for every students. Thus, this study aimed to determine factors that influence the student's cycling intentions in campus by using Ajzen's Theory of Planned Behavior such as attitude, social environment, perception and infrastructure as a theoretical framework. Approximately 400 undergraduate students in UUM are chosen to complete the questionnaire provided by using convenience technique. The results of Cronbach's alpha score for the independent variables (IV) and dependent variable (DV) is 0.944. There is significant relationship between IVs and DV among UUM students.

Keywords: *cycling intention, Theory of Planned Behavior, green transportation*

INTRODUCTION

High growth rates transport activities generated a negative impact on the environment and population (Eppel, 1999) that is experiencing various traffic problems such as severe traffic congestion and road accidents coupled with air pollution and noise (Sarkar and Tagore, 2011). Whether via car, via train, plane, or boat, each mode of transport has its own limitations identified with sustainability, and especially to environmental change. Subsequently, individuals are urged to utilize more sustainable transport, which can incredibly decrease the natural effect. Bicycle is one of the good choices of land transport that will preserve the environment by reducing the usage of car, motorcycle, bus, taxi and also lorry and their pollutants. Besides, cycling is consider a physical activity that bring a lot of benefits to the health condition of people.

Some of the studies have concentrated on the components of a target measure of the environment context (design of bike ways, the connectivity system of streets, population density, and land use), and the variables of socioeconomic and demographic factors (age, sexual orientation, income, education). In spite of the fact that there is a

relationship appeared between certain aspects of the built environment and the choice to cycle for transportation (Dill and Carr, 2007), improvements to the constructed environment would not be adequate to support cycling. Different variables likewise impact the result of the cycle. This paper presents a research about those other factors—including attitudes, social environment, perceptions, and infrastructure that influencing the intentions to cycle to their destination.

STATEMENT OF PROBLEM

University has provided shuttle bus service for students lead to lack of cycling intention among students. Student behavior on cycling will reduce as the main transportation used by them to travel is bus (Anable, 2005). However, it still causes many students face the travelling issue which they missed departure due to wrong real-time info. Based on this incident, UUM bicycle club should implement some activities to attract interest of cycling among students. It can build a good attitude to be a cyclist that can save the environment freshness and excellent perception to keep healthy lifestyle for community (Mandic, 2016). Cycling intention apply to all student are able to maintain the green environment in UUM with the beautiful landscape, we encourage students to apply transportation that reduce air pollution which is cycling (Perrin, 2001). However, the bus service and private vehicle still utilize for student. Hence, quantity of carbon footprint will not minimize which daily conducts and interactions of the students. Social environment concept around student mindset is significant when we change to cycling in the campus.

As a result of shuttle bus service issue, some students are willing to drive own vehicle into campus as they feel more handy to move around the campus (Prioni and Hensher, 2000). However, this way has become negative impact to the traffic in campus which creates congestion issue (Foley, 2016). It will indirectly to influence the perception of student which they will be more likely to drive own vehicle than be a cyclist (Emond, 2009). Moreover, insufficient infrastructure for bicycle in university can influence the number of students to cycling. Students will feel that cycling is unsafety transport for utilize to destination. The cyclist sophisticate from apply bicycle infrastructure can enhance their view and when it relate to specific needs in regards to the devise of infrastructure in university (Mitchell, 2016). Hence, the study is factors that influencing the intention to cycling towards UUM student. It can improve students understanding of environmental notions and their planning utilization. As such, there must clearly comprehend on the Theory of Planned Behavior (TPB) which includes attitude, social environment, perception and infrastructure that influence cycling intention toward students in UUM.

LITERATURE REVIEW

Cycling intention

Intention is supposed to catch the determination elements that impact a conduct; they are sign of how hard individuals will attempt, of the amount of an exertion they are consideration to execute, with a specific end goal to play out the conduct. This idea of intention manages the individual's determination or push to accomplish something in a specific way. High quantities of text disclose that intention can be anticipated through

mentalities and evaluating the level of approach through mentalities towards the conduct, social environment and perception control elements. These three factors are great conveyed in theory of planned behavior principle which is identified with the individual conduct and its part has been extremely builds the cycling intention (Ferreira, 2012).

Intention can be classified into three which are positive, negative and unintended (Geib, 1992). It is clarified that affirmative intention is referring to an individual resolving to conduct a behavior in a particular of time. In contrast, negative intentions interpreted that an individual committed not to execute that activity or the activity is avoided to carry out. Furthermore, unintended activity portrayed that particular deportment which is not considered as positive or negative due to no commitment. According to Ajzen (1991) mentioned that the primary idea for theory of planned behavior is the intention that stand for some point of view to measure of exertion that a man will contribute to execute a specific conduct. As indicated by this principle, more affirmative attitudes toward the particular conduct, a more claimed subjective standard and perceived behavioral control prompt more prominent expectation to execute that deportment.

Attitude

According to Bohte et al. (2009) mentioned that attitude as “an attitude is a mental trend that is conveyed by assessing a special entity with some degree of advantage or disadvantage.” In spite of the conventional comprehension of attitude as an affirmative or unfavorable assessment of an issue, the build of state of mind in theory of planned behavior about exclusively to disposition towards the conduct. Additionally, the attitude is comprehended as a favorable or unfavorable assessment of one's implementing of the deportment in a problem (Ajzen, 2008).

Based on Ajzen (1991), attitude towards the conduct refers to the “extent to which an individual has an advantages or disadvantage assessment of the deportment in issue”. Furthermore, attitudes consist of discernment on whether conduct under contemplation is favorable or unfavorable, and whether the player accepts to act the conduct (Leonard et al., 2004). Ramayah et al. (2010) mentioned that attitude contain perceived outcome connected with conduct. As stated by Kotchen and Reiling (2000), attitude is the main vital forecaster of behavioral intention. Attitude is the psychological affection routed through customers' appraisals and, if affirmative, behavioral intentions tend to be more positive (Chen and Tung, 2014).

From the Schlenker (1992) stated that attitude helps us characterize how we see circumstances, and additionally characterize how we carry on toward the circumstance. As explained in the tri-part prototype, manners contain emotions, thinking, and activities. Attitudes additionally supply us with interior perceptions or convictions and thinking about human being and objects. Approaches cause us to execute in a specific route toward an object or individual. In spite of the fact that the sensation and conviction parts of manners are internal to an individual, we can see a man's attitude from his or her subsequent conduct (Lord, 1991). Attitudes absolutely interacted with bicycle utilize consist concern for environment and attitude towards cycling. This might be generates human to drive less in order to protect environment and assign bicycle as transportation.

Social environment

An individual's social environment is defined by one's living and working environment and community characteristics and can be "experienced at multiple scales, often simultaneously, including households, kin networks, neighbourhoods, towns and cities, and regions" (Barnett and Casper, 2001). The social environment includes historical and power relations within communities. Person-environment fit and residential neighbourhood type "dissonance" are two related concepts that have been used to address social determinants of behaviour. The latter concept has been used to explore mode choice in the context of residential self-selection (Schwanen and Mokhtarian 2005). Social environment subsumes numerous parts of the physical environment, given the contemporary scene, water assets, and regular assets that others have been in any event somewhat arranged by human social procedure. There are a lot of research paper which referred to social-environmental factors of cycling, for example, the subjective norm, the descriptive norms, the effect of the neighbourhood, the community opinion on cycling, the effect of family and friends, and the effect of the workplace.

Perception

Like most concepts within the social science disciplines, perception has been defined in a variety of ways since its first usage. From the Oxford University Press (2015), perception is defined as an act of being aware of "one's environment through physical sensation, which denotes an individual's ability to understand". Moreover, perception also can define as a single awareness derived from our sensory process when a stimulus is presenting (Roslina et al., 2011). Based on Pickens (2001), perception is a process to interpret or perceivers may be has a range different from other. Perception is one of the factors which influence the level acceptances in cycling intention. While according to Willis et al. (2015), perceptions are associated with cycling for transportation which including perceptions of benefits, perceptions of barriers, perceptions of safety and perceptions about cycling routes.

Based on Adam (2013), cycling can lose fat and burn calories by increasing heart rate and this will helping to achieve your weight loss goals. However, the main barrier to more utility cycling by leisure cyclists is their fear of traffic and many of the potential cyclists are depending on better cycling infrastructure (Schwartz,2009). A survey taken in September and October 2015, respondent were asked to rate the amount at which they were "concerned about safety when cycling in your city" on a scale of 1 to 5, three-quarters of such riders said they were either "very concerned" or "extremely concerned."(Andersen, 2015). According to Dill and Voros (2007), the perception of the quality of routes available for cycling has an effect on the decision to cycle as people agreed that the available of high quality bicycle lands that are easy to get will attract them choosing cycling as their transportation.

Infrastructure

Transport infrastructure comes in two primary structures; human-made infrastructure and normal infrastructure. Both sorts of infrastructure are imperative to interfacing spots and individuals over the SEQ locale. Human-made transport infrastructure is intrinsically unsustainable nonetheless, with implicit outdated nature and direct ecological effects from its development. Likewise, the working of expansive infrastructure extends regularly has noteworthy distributional contacts concerning social/natural manageability (Ecosystem service, n.d.).

According to previous research, transport infrastructure had a close relationship towards safety of the bike rider which will eventually increase the intention to cycle. According to Schoon and Van Minnen (1994), there is 8% reduction in bicyclists' crash rate and 30% reduction in injury rate were observed following installation of new roundabouts. Among the 3 styles of roundabouts, those with cycle tracks had the greatest reductions in injuries to cyclists and moped users (90%), compared to those with no bicycle infrastructure (41% reduction) and those with a cycle lane (25% reduction). There was an 8% increase in crash frequency in the study area, but bicycle volume on these intervention sections grew by 50% more than unchanged streets - authors conclude that the intervention may have resulted in a safety improvement (Gårder et al., 1998).

RESEARCH METHODOLOGY

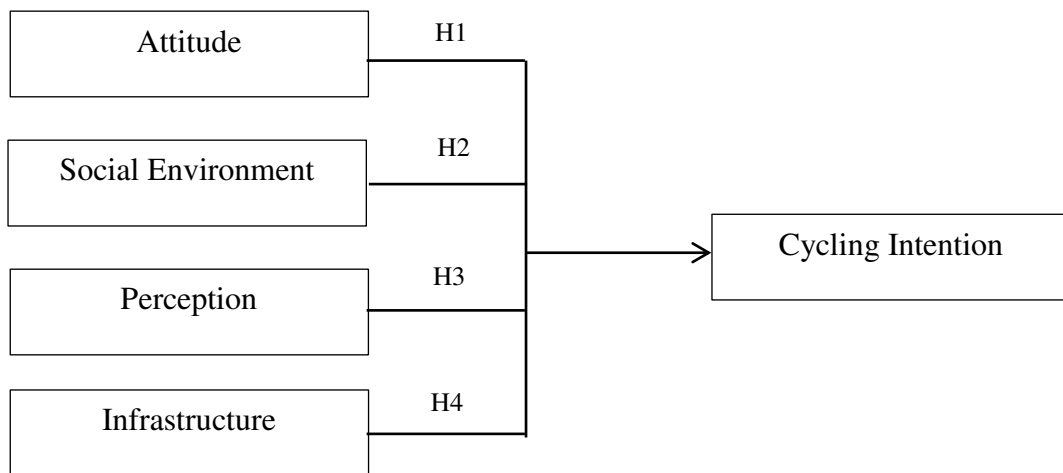


Figure 1
Theoretical framework

In this research paper, we have constructed the above conceptual framework as a basis for our study. This conceptual framework is specifically focused on cycling intention. This framework has one dependent variable and four independent variables. The arrows in above conceptual framework indicate that there is a relationship in between the dependent variable and independent variables.

Research hypothesis

H1: There is a relationship between attitudes and cycling intention among UUM students.

H2: There is a relationship between social environments and cycling intention among UUM students.

H3: There is a relationship between perceptions and cycling intention among UUM students.

H4: There is a relationship between infrastructure and cycling intention among UUM students.

Research design

A correlation study is chosen to examine the relationships between the independent variables (attitude, social environment, perception and infrastructure) and dependent variable (cycling intention). Quantitative approach is using in this research, thus we will discuss and explaining the phenomena by collecting numerical data and analysis using mathematically based methods. Research study setting will be done in the natural environment where work proceeds normally which is non-contrived setting with minimal interference from the researcher. The unit of analysis in the study is individual as the data is collected from individual students. Cross-sectional studies was used in this studies due to the data are gathered just once time from each individual respondent.

Sampling and data collection

In the study, primary source was used. Primary data is defined as data collected for a particular issue at hand through the use of best step to fit the study issue (Hox & Boeije, 2005). The intelligence in the study is about the cycling intention among UUM students based on the four elements which are attitude, social environment, perception, and infrastructure in TPB. Hence, the questionnaires are collected using online survey and answers by the undergraduate students of UUM through Google Form. In this research, questionnaires were utilized to acquire data applicable to the study's objectives and research questions. The primary data is collected through questionnaire. Self-administered questionnaires are executed in the study.

Questionnaire development

In this research, the development of the instrument used developed by the researchers. The questionnaire was designed as a tool to collect data because it is the most popular method of providing reliable data. The questionnaire is the method of data collection which is widely used because it helps to gather information on knowledge, opinions, attitudes, behaviors, facts and others information (Radhakrishna, 2007). In this research, the questionnaire included four independent variables and one dependent variable. The independent variables are the attitudes, social environment, perception, and infrastructure. The dependent variable is cycling intention among UUM students inside the campus. The questionnaire consists of 36 questions covering demographic factors and variable, each variable consists of 6 questions. Likert scale is used in this study to measure the responses. Five-level Liker Scale used in the research that every item measures with "Strongly Disagree", "Disagree", "Neutral", "Agree" and "Strongly Agree".

Data analysis

Data analysis is the statistically analysis of data gathered by the researcher. This study employed quantitative data analysis where questionnaires were distributed to the four-hundred respondents in UUM. After the collection of data, the next step is to analyse and interprets the data is obtained from the respondents of the questionnaire. Analysing and interpreting data is to determine the conclusion, significance and the implications of findings. The tool which extensively used for statistical analyse is the Statistical Package for Social Science (SPSS) version 23.0. There were many type of analysis method which available in the SPSS to test the truthfulness of the collected data. The higher the Cronbach's alpha score, the higher the internal consistency reliability. Pearson correlation is used to measure the strength and direction of linear relationship between independent variable and dependent variable involved in the study. The

coefficient of correlation shows the extent to which changes in the value of one variable are correlated to changes in the value of the other (Udovičić, et al., 2007).

RESULTS

The results of the present study which extensively used for statistical analyze is the Statistical Package for Social Science (SPSS) version 23.0 software.

Table 1
Cronbach's alpha scores for variables

Variables	No. of Items	Cronbach's alpha
Attitude	6	0.860
Social Environment	6	0.848
Perception	6	0.829
Infrastructure	6	0.862
Cycling Intention	6	0.834

According to Sekaran and Bougie (2013), reliability coefficient that less than 0.6 are considered to be poor, those in 0.7 is acceptable and those over 0.8 are good. In the study, Cronbach's alpha for the five variables score ranges from 0.829 to 0.862 as indicated in Table 1. Therefore, all the variables have been proven to be reliable and consistent.

Table 2
Correlations table

		Attitude	Social Environment	Perception	Infrastructure	Cycling Intention
Attitude	Pearson Correlation	1	.573**	.117*	.221**	.384**
	Sig. (2-tailed)		.000	.019	.000	.000
	N	400	400	400	400	400
Social Environment	Pearson Correlation	.573**	1	.054	.251**	.365**
	Sig. (2-tailed)	.000		.281	.000	.000
	N	400	400	400	400	400
Perception	Pearson Correlation	.117*	.054	1	.274**	.271**
	Sig. (2-tailed)	.019	.281		.000	.000
	N	400	400	400	400	400
Infrastructure	Pearson Correlation	.221**	.251**	.274**	1	.295**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	400	400	400	400	400
Cycling Intention	Pearson Correlation	.384**	.365**	.271**	.295**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	400	400	400	400	400

** . Correlation is significant at the 0.01 level (2-tailed).

From Table 2, the p-value for all the five variables is equal to 0.000 at which it is less than significant level value of 0.01. Therefore, we can conclude that there is a significant correlation between independent variables (attitude, social environment, perception and infrastructure) and dependent variable (cycling intention) respectively.

There is a positive relationship between all the independent variables to cycling intention among UUM students.

DISCUSSION

All TPB components were significant predictors as expected. In this study, result had revealed that attitude is the strongest predictor of intention toward the student's intention to cycle in campus. Attitude exerted the strongest impact on intentions ($r = 0.384$, $p < 0.01$), followed by social environment ($r = 0.365$, $p < 0.01$), infrastructure ($r = 0.295$, $p < 0.01$), and perception ($r = 0.271$, $p < 0.01$). It is consistent with the literature on attitude is the strongest predictor toward intention. From the findings of the study, attitude has significant and positive effect on students' intention. This meant that the persons will firstly consider their attitude before they decide on whether or not to use it. Students whose hobby is cycling are tend to cycle more inside the campus and students who enjoy riding for a short distance are more likely to cycle from residential area to their classes. The attitude of the benefits seen in connection with the intention of cycling, and reflects the feelings of someone enjoy and excitement to cycle.

Social environment is the second significant predictor of the student's intention to cycle in UUM campus. In this study, Social environment exerted second strongest influence to intention of cycle ($r = 0.365$, $p < 0.01$). Social environment also show significant contribution to the prediction of attitude. This is because social environment of a student will most likely influence the attitude of the students. Social environment focus on the physical environment, social relations, and social environment in which characterized defined groups of people function and interact. These include subjective norms, descriptive norms, and effects of workplace, neighbourhood, family and friends. Social environment of a student that encourage them to cycle include peer pressure, university encouragement, family influence, supportive surrounding, and facility inside the environment. Students tend to effects by the family since young to have the habits of cycling, and they will continue to cycle inside the campus. Besides, when students are in campus, they are away from their family, which university and friends encouragement become major influence to them for cycling intention. Thus, social environment is having a significant and positive relationship with student's intention to cycle.

Perception is the least significant predictor of the cycling's intention in campus ($r = 0.271$, $p < 0.01$). Perceptions are associated with cycling for transportation which including perceptions of benefits, perceptions of barriers, perceptions of safety and perceptions about cycling routes which have significant influences the students' cycling intention in the campus. Cycling can reduce congestion and also can save the journey times from congestion. Thus, student will perceived benefits of cycling and intent to use cycling as the main transportation in the campus. However, the main barrier to more utility cycling by leisure cyclists is their fear of traffic and many of the potential cyclists are depending on better cycling infrastructure. Besides that, the perception of cycling as a safe mode of travel is a significant influences the use of bicycles in campus. The main barrier for safety to cycling in campus is the perception that our roads are too dangerous and uncomfortable due to high volumes and driver did not follow the speeds limit of motor traffic.

Infrastructure is the third significant predictor of the student's intention to cycle inside the campus with $r= 0.295$, $p<0.01$. Infrastructure is considered one of the variables that affect the intention because with adequate infrastructure, students will feel more comfortable to cycle in campus. Examples of infrastructures that help in enhancing students' intention are biking lane or path with a completely shelter to prevent raining weather, intersection with accident prevention facilities, sufficient bike parking space, and clear signboard. Transport infrastructure had a close relationship towards safety of the bike rider which will eventually increase the intention to cycle. Good infrastructure will improve the connectivity and accessibility of students from their residential area to their classroom. Thus, with a good infrastructure, students are able to fully utilize the facilities and increase their intention to cycle inside the campus.

Lastly, a superior for comprehension of the factors that affect students' intention are able to assist in the planning and implementation process in the future. In addition, it will also help to better understand students' desire to convert to sustainable transport and environmental value. Instead, it will promote the development of ethical behavior among them towards preserving and protecting the environment.

LIMITATION

In the process of doing this research paper, there are several limitations have been found in conducting the research. The main limitation encountered during process this research is the time constraint. In fact, during the collection data period, some of the respondent did not return back the questionnaire to researcher, lost the questionnaire and did not completed answer all the question has been provided. Thus, this will causing the delay in the data collection process. Since the researchers only have three month period to conduct this research paper, the delay from data collection process will cause delay for the following part for the whole research process. This may influence the accuracy result for this research. Furthermore, this research is carry out in Universiti Utara Malaysia and only undergraduate students are chosen to assist in this research. Thus, this research is not generalize all the student around the world. Hence, this may influences the accuracy result of this research because respondents in other universities around the world might have different cycling's intentions.

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