The roles of public opinion on planning pedestrian streets in Ho Chi Minh City

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Abstract: The purpose of this paper was to apply social psychology to survey public opinion about alternatives of constructing two pedestrian streets in Ho Chi Minh City and to study the effects of public perceptions of the benefits of constructing the walking streets on their intentions to join in the pedestrian streets. Survey result shows that people have strong intentions to come to enjoy the pedestrian streets if they are built. We also found that the design of leisure & scenery pedestrian streets is more sensitive to people perceptions about improving urban civilization. Results from the structural equation models revealed that the behavioral intention of using the pedestrian street was significantly influenced by perceptions of the benefits of the walking street.

Keywords: Pedestrian streets, planning, public opinion, Ho Chi Minh City

1. INTRODUCTION

Pedestrian street is one form of local transport planning highly related to urban culture. A waking street normally dedicates road space more for leisure activities than for mobility. Based on the purpose of use, walking streets can be divided into four types: (i) Relaxation; (ii) Shopping, (iii) Cultural scenery and (iv) Complexity walking street. Therefore, planning walking streets requires both knowledge of architecture/traffic engineering and understanding of pedestrian behavior from socio-cultural viewpoint. This is because pedestrian behavior is not only dependent on physical environment but also dictated by culture (Rapoport, 1987) which may be different between the East and the West, between developed and developing countries.

Ho Chi Minh City is a developing city with a population of more than 7.2 mil people. This largest city in Vietnam welcomes annually about 3 mil foreign tourists and more than 6 mil domestic tourists. Therefore, the city has a schedule to construct walking streets for outdoor leisure and shopping, not only as a strategy to improve tourism environment but also as a strategy to reduce vehicular use and to promote the environmental friendly mode of walking. According to the Plan to develop transport of Ho Chi Minh City until 2020 (TEDISOUTH, 2007), the area for pedestrian at city center is bounded by some streets e.g. Nguyen Thi Minh Khai St., Cach Mang Thang 8 St. (see Figure 1). There were some proposals for transforming some specific routes to commercial and historical walking streets. Among them, based on classification criteria and traffic simulation, Minh (2012) found that Nguyen Hue St. and Cong Xa Paris St., as can be seen in Figure 1, are most suitable to organize walking streets. Nguyen Hue St. is now a place for shopping while the area around

Cong Xa Paris St. covers a park and the Notre-Dame Cathedral.

In a developing country of China, there were many examples that transformed normal streets to commercial walking streets, like Wangfujing Street in Beijing, Commercial Streets in Jiangjin, Chongqing, Nanping Street and DongSi Street in Kunming City. Transformation and construction of those walking streets were generally followed by social psychological studies which considered many aspects including behavior, business prospect, historical places preservation, landscape design... For example, Zhang (2009) analyzed the background and transformation measures together with evaluating the effects of the activity from the perspective of environmental psychology. He finally proposed measures to build vigorous commercial walking streets with the analysis on the psychology of behavior of the people. Li (2002) analyzed environmental and local civilization features about the commercial walk street in Jiangjin.

In America, many downtown pedestrian malls was built during the mid of 1900s. Many of them have been unsuccessful despite careful planning and investment. Schmidt (2010) found that impact on traffic which consequently reduces the ease of access to the pedestrian malls is one of the important factors. Besides, street's length, width, closure scheme and land use are also critical to the success of a pedestrian mall. Those factors generally comprise the benefits of the pedestrian to the users. Thus in planning process of a pedestrian street, determining how users perceive about the benefit it brings to them it is quite important.

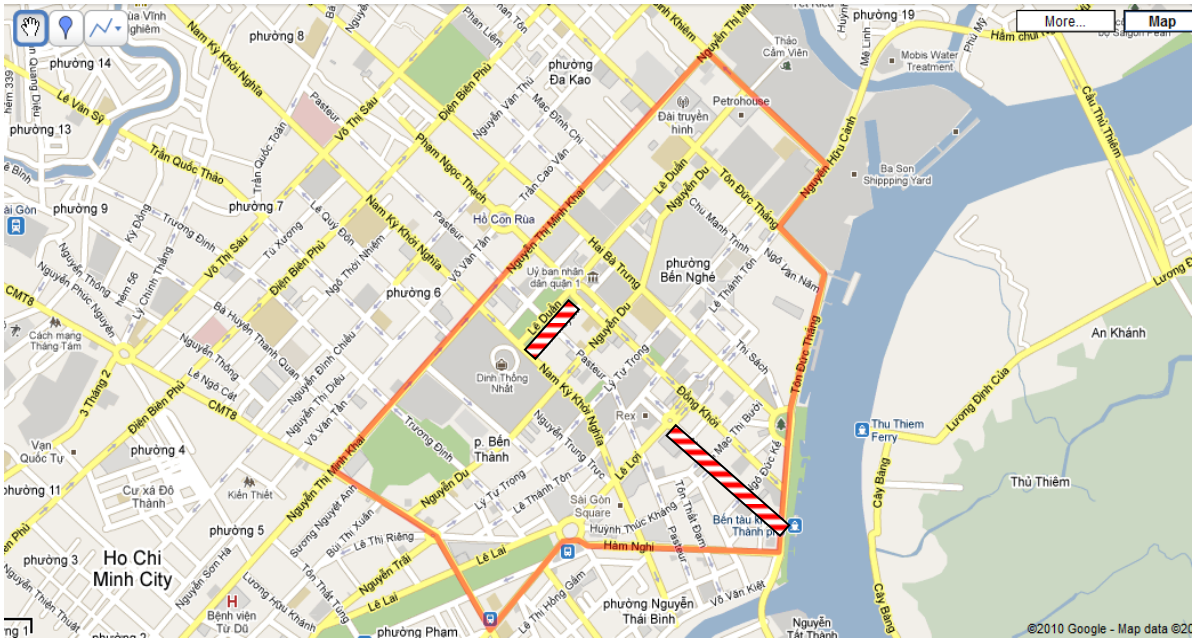


Figure 1. Approved pedestrian area with two studied walking streets in Ho Chi Minh City

Notes: The pedestrian streets are hatched with pattern

Going back to the case of Ho Chi Minh City, it is still argued about effectiveness of the enjoyed space of the being-planned pedestrian streets (i.e. whether there is advocacy from the public to join in the walking streets, whether walking behavior is inherent to Vietnamese culture…). The direct relation between cultural aspects and walking decision is rarely considered, particularly in the urban environment of developing countries (Florez, 2007). Moreover, a measure of possibility that people will prefer to use the built-walking streets is necessary for policy makers in planning and design pedestrian streets.

In predicting behavior, the Theory of Planned Behavior (Ajzen, 1991) is regarded as one of the major psychological theories that have been applied in travel behavior. The theory

states that people's behavior can be derived from their intentions, which in turn can be explained by people's attitudes towards the behavior, their subjective norm, and their perceived behavioral control. Attitude or perceptions of the benefits of the behavior refers to beliefs about the behavior, whereas subjective norm indicates beliefs about normative expectations of others. Perceived behavioral control can be defined as the perceived ease or difficulty of performing a behavior. This factor is assumed to reflect past experience and anticipated impediments of respondents in conducting a behavior.

Based on the core variables according to the Theory of Planned Behavior, in the present study, we argued, through our empirical finding, that the behavioral intention of using the pedestrian streets can be influenced by several psychological factors. Specifically, we hypothesized that attitudes or perceptions of the benefits of building the pedestrian streets is one important factor that could shape the degree of behavioral intention of coming to enjoy the pedestrian streets. In the behavior of coming to pedestrian streets, subjective norm seems to be less practical and thus may confuse respondents so we did not include this factor in the model. Figure 2 illustrates the proposed modeling framework.

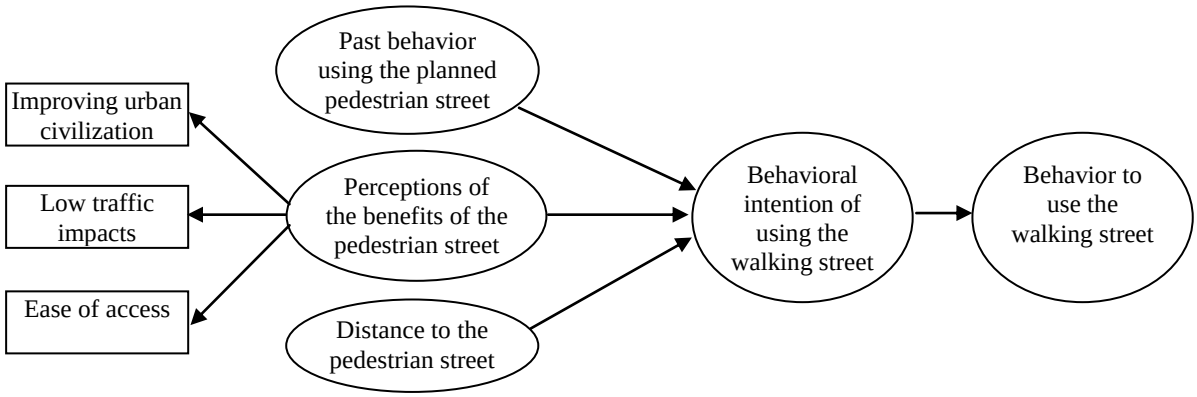


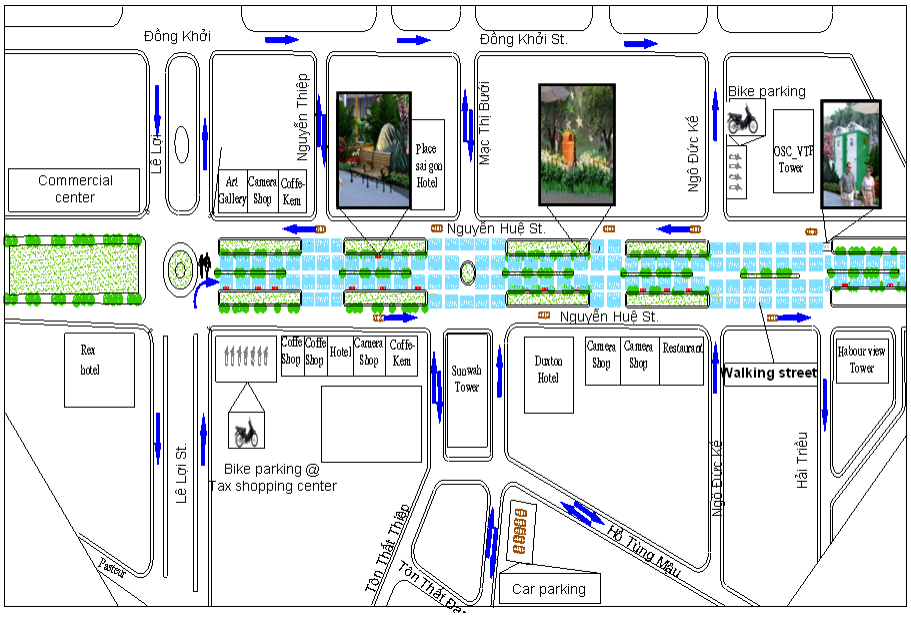
Figure 2. Hypothesized model of causal structure related to using the walking street

Therefore, the purpose of this paper was to apply social psychology to collect public opinion about alternatives of construct those two pedestrian streets in Ho Chi Minh City and to study the effects of public perceptions of the benefits of constructing the walking streets on their intentions to join in the pedestrian streets after they are built. This paper is organized as follows. The first section provides an introductory background on the research. Motivation and objectives are discussed. The following section details research methodology, including the survey and questionnaire. Section 3 presents our estimation results and discussion. The paper ends in Section 4 with conclusions.

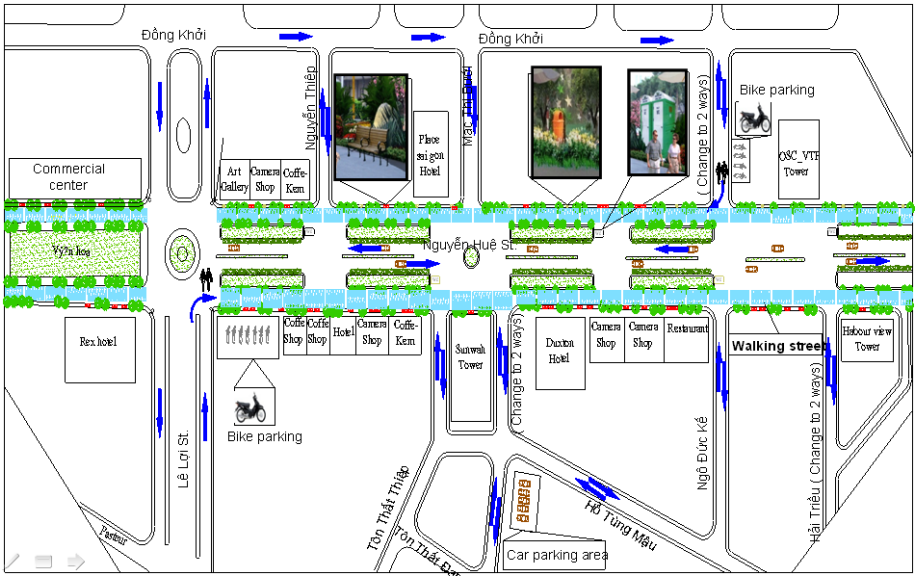
2. METHOD

Survey and questionnaire

Two pedestrian streets representing for pedestrian shopping streets and leisure & scenery pedestrian streets were targeted at this study including Nguyen Hue walking street and Cong Xa Paris walking street. As mentioned in Section 1, Nguyen Hue walking street including only one route of Nguyen Hue St. presently is a place with many shopping malls for foreign tourists and local customers, thus will be planned as a *pedestrian shopping street*. Meanwhile, Cong Xa Paris walking street, comprising of Han Thuyen St. and Cong Xa Paris St., has some



Alternative 1A



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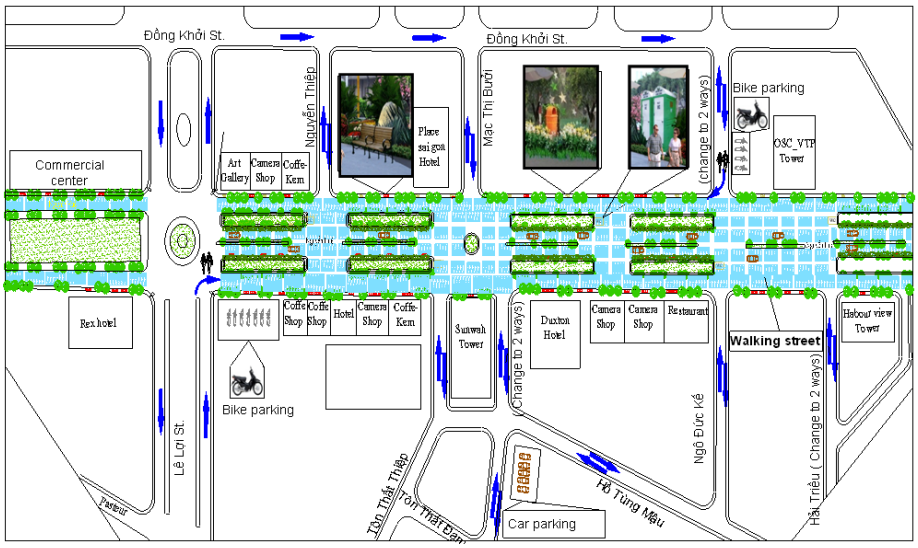
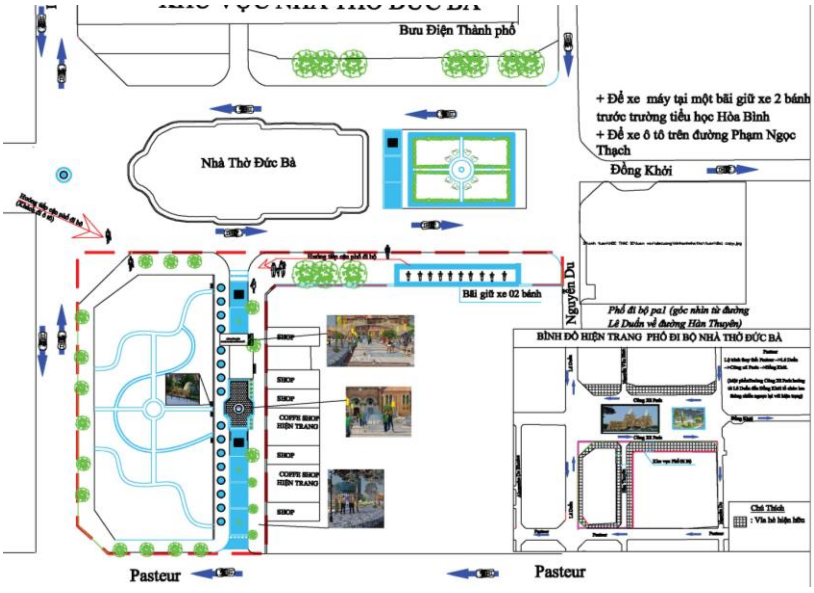
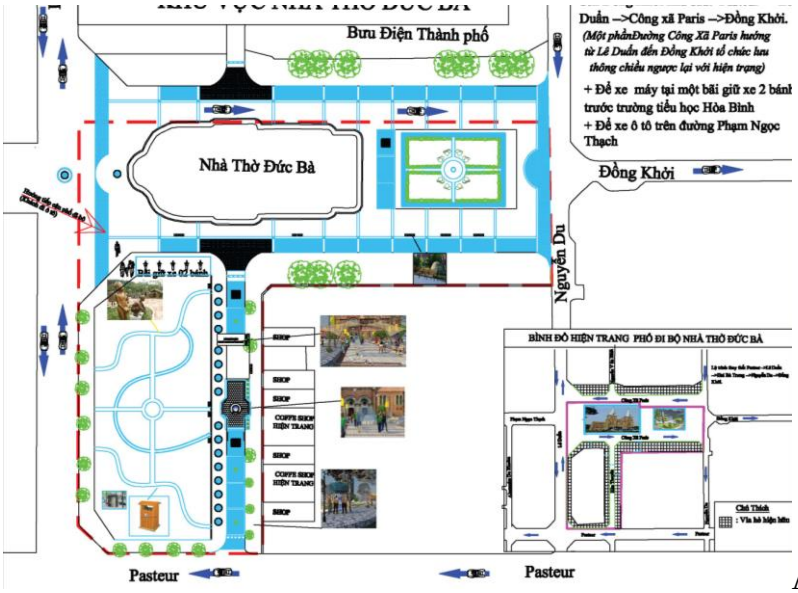


Alternative 3A

Figure 3. Spatial plan designs of Nguyen Hue walking street (pedestrian shopping street)



Alternative 1B



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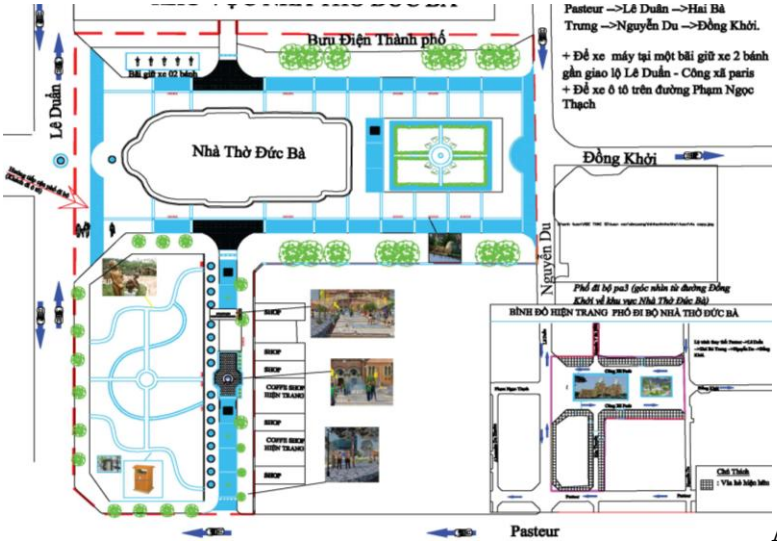


Alternative 3B

Figure 4. Spatial plan designs of Cong Xa Paris walking street (leisure & scenery pedestrian street)

facilities for leisure and visiting like a park and a cathedral; thus could represent for a *leisure & scenery pedestrian street*. Participants, surveyed for each of the above, were randomly selected at sites near the two expectative walking streets. Totally, 347 people (34% female; age of 18-76 with mean/SD: 32.2/12.6) near the area of the intended pedestrian shopping street and 266 people (43% female, age of 18-83 with mean/SD: 28.0/9.6) near the site for the planned leisure and scenery pedestrian street participated in the survey in January 2013.

Participants were first asked whether they used to walk on the street that is intended to be built as a pedestrian street. Next, spatial planning and 3D designs and explanations of how the corresponding walking street will be organized were presented to the participants. Three alternatives different mainly in terms of spatial lay-out were made for each site. Figure 3 and 4 present the plan designs of the three alternatives for each pedestrian streets. Alternative 3A and 3B expand most walking space for the corresponding pedestrian streets while Alternative 1A and 1B occupy least area. Then, the participants at each location were asked to select one alternative that they think most suitable to set up the walking street. After that, the participants were asked to evaluate the benefits of organizing the walking street in three aspects: Improving urban civilization, low traffic impacts, ease of access. Specifically, *"With your choice, how do you think about the effectiveness of organizing the pedestrian street on improving urban civilization?"* was asked in order to capture improving urban civilization, whereas *"With your choice, how do you think about the impact of organizing the pedestrian street on traffic of the area?"* was to measure perceptions of low traffic impacts. And the question *"With your choice, how do you think about the ease of accessing the pedestrian street?"* was asked to get respondent perceptions on ease of access. A five-point scale, ranging from *"Worse"* (1) to *"Better"* (5) was consistently used for these questions. Finally, the respondents were asked about the time distance from their home and their intentions to come to enjoy the pedestrian space to be built.

3. RESULTS

3.1 Descriptive statistics

Table 1 displays the distributions of the respondents on the intentions to come to enjoy based on a five-point scale measuring from 1 to 5, along with the corresponding mean and standard deviation values. Based on the scale, respondents with higher scores would indicate higher intention. It can be observed from Table 1 that the most people have strong intentions to join in the walking streets. The highly positive result put a good signal that walking behavior together with morning exercise that prevails nowadays in parks in Ho Chi Minh city may be favored by Vietnamese people.

An analysis of variance (ANOVA) was conducted, and a difference in these mean values between the two walking streets was found no significance ($F(1,613) = 0.436$). This implies that there was no difference between two forms of pedestrian streets regarding people intentions to use the walking streets.

Table 1. Descriptive statistics of Intention to come to enjoy the walking streets

Walking street	Distribution of scores (%)					Statistics	
	1	2	3	4	5	Mean	SD
Pedestrian shopping street	0.9	3.2	20.7	22.5	52.7	4.23	0.94
Leisure and scenery pedestrian street	0	2.7	14.3	35.7	47.4	4.28	0.80

3.2 Linear mixed models

In order to investigate the effects of alternative designs on perceptions of observations about the benefits of pedestrian streets, linear mixed models were used in this study. Results show that Alternative 3A of the pedestrian shopping street tended to have higher scores in two out of three aspects, i.e. Low traffic impacts and ease of access. However such differences were all insignificant. For the leisure & scenery pedestrian street, it is found that Alternative 3B here was more favorable in terms of improving urban civilization and having low traffic impacts. Moreover, the three alternatives were also significantly different in the rating of improving urban civilization. This implies that the design of leisure & scenery pedestrian streets is more sensitive to people perceptions about improving urban civilization. Meanwhile, traffic impact seemed not to be perceived different much across three alternatives of this type of walking street.

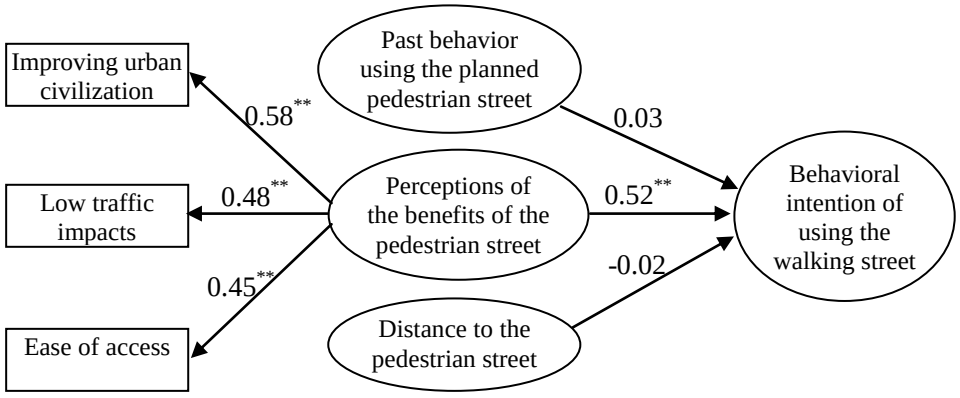
Table 2. Estimates of effects of alternatives

		Improving urban civilization	Low traffic impacts	Ease of access
Pedestrian shopping street	Constant	4.638**	3.829**	4.295**
	Alternative 1A	-0.072	-0.050	-0.154
	Alternative 2A	0.021	-0.007	-0,210
	Alternative 3A	-	-	-
Leisure & scenery pedestrian street	Constant	4.670**	3.566**	3.868
	Alternative 1B	-0.270**	-0.066	-0.095
	Alternative 2B	-0.240*	-0.037	0.073
	Alternative 3B	-	-	-

- Not relevant; ** Significant at 1% level; * Significant at 5% level.

3.3 Structural equation model

In this model, we hypothesized that the behavioral intention of using the pedestrian street to be built as preference could be explained by perceptions of the benefits of the walking street, past behavior of using the planned walking street and perceived behavioral control measured in terms of distance from home to the walking street. In this study, the benefits of the walking street were measured using three scales: Improving urban civilization, low traffic impacts, ease of access. The data from the two sites were combined for analysis.



($\chi 2$ =4.08, d.f. = 6, RMSEA = 0.00, GFI = 1.00, NFI = 0.98, CFI = 1.00)

- Not relevant; ** Significant at 1% level; * Significant at 5% level.

Figure 5. Results of LISREL analysis for the model

The linear structural relation (LISREL) 8.53 software (Jöreskog and Sörbom, 1993) was selected for structural equation modeling analysis. Figure 2 shows the structural model with standardized path coefficients. Overall, the estimation of the model yielded a $\chi 2$ value of 4.08 with 6 degrees of freedom and accounted for 27 percent of the variance in the behavioral intention. The standardized direct effects on behavioral intention were 0.03 for past behavior, 0.52 for perceptions of the benefits of the walking street, and -0.02 for perceived behavioral control. Only perceptions of the benefits of the walking street were significant at the 99.9% level. It should be noted that the perceived behavioral control did not found here to be a statistically significant determinant for behavioral intention of enjoying the walking street. Neither did the indicator on past behavior.

A review of the goodness-of-fit statistics shows that the model fitted the data rather well. In this case, the GFI of 1.00 was higher than the cutoff value of 0.90 and the RMSEA value of 0.00 was lower than the upper limit of 0.10. The chi-square/d.f. of 0.67 was well below the recommended value of 3.00. The NFI and CFI values were all above the recommended values of 0.90.

4. DISCUSSION & CONCLUSIONS

We found that people have strong intentions to come to enjoy the pedestrian streets if they are built. This can be implied that Vietnamese people do not have an aversion to social connections and thus street culture could be a way of building bridges between people. This could lead to pervasive spatial design, formation and use of pedestrian streets in planning policy. Besides, Alternative 3A for the pedestrian shopping street and Alternative 3B for the leisure and scenery pedestrian street were found to have higher rating scores by the respondents. Specific results of public opinion regarding spatial designs are quite useful to planners in their decisions on the scale of the planned walking streets. Moreover, for the leisure & scenery pedestrian streets, the significant differences in the rating of improving urban civilization across three alternatives implies that the design of this type of pedestrian streets is more sensitive to people perceptions of whether building the walking street could improve urban civilization.

Results from the structural equation models revealed that the behavioral intention of using the pedestrian street was significantly influenced by perceptions of the benefits of walking street. The perceived behavioral control and past behavior, however, did not significantly influence the behavioral intention. There are two points to be noted from these findings.

First, only perceptions of the benefits of the walking street were the prominent for the behavioral intention of using the walking street. Moreover, all three aspects including improving urban civilization, low traffic impacts, ease of access, were also found to be of statistical significance. Consequently, it can be implied that intervention of beliefs about the benefits of the pedestrian street would be probably the most effective way in promoting the make use of pedestrian street. One potential approach can be done by means of an informative campaign aimed to make people understand, having them contribute their opinions as well as enhance their perceptions of the benefits of constructing a pedestrian street to local traffic, to people and to the society in general.

Secondly, it should be noted that the distance from home to the pedestrian street regarded as perceived behavioral control, did not found to be a statistically significant determinant for behavioral intention of enjoying the walking street. This implies that far distance might not significant reduce people intention to come to the walking street for their

own purposes. This is because the factor of perceptions of the benefits of the pedestrian street has a strong effect on behavioral intention thus overshadows the effect of distance. This means that regardless of how far the walking street is, we would come to enjoy if it is good. This is a good indicator that we can attract more far-off visitors to the walking street as far as the service quality is improved. This is a very important factor to ensure the effective planning and operating of a pedestrian street.

In conclusion, the findings from the present study are expected to be pilot for developing walking streets for developing countries. Nevertheless, results are still far from definite and further investigation is urgently needed to investigate the actual behavior after walking streets are built. Therefore, future work needs to explore the consistency between intention-behavior of using pedestrian streets to complete the framework that was proposed in Section 1. Besides, in this study we just examined some basic factors to behavioral intention of using the two typical pedestrian streets. In fact, there are various forms of complexity walking streets in terms of schemes, space treatments. Each form of pedestrian streets may have some other specific factors that should be carefully examined. This is possibly the avenues for future researches.

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