

The Impact of Street Vendors Activities on Pedestrian Behavior

SCS-10-017

Nursyamsu HIDAYAT¹, Kasem CHOOCHARUKUL², Kunihiro KISHI³

¹Department of Civil Engineering, Faculty of Engineering
Chulalongkorn University
Telephone 0894597829
E-mail: nursyamsu_h@yahoo.co.id

²Department of Civil Engineering, Faculty of Engineering
Chulalongkorn University
Telephone (662) 218-6695, Fax. (662) 251-7304
E-mail: kasem.choo@chula.ac.th

³Laboratory of Transportation Intelligence, Graduate School of Engineering,
Hokkaido University
Telephone +81- 011-706-6209, Fax. +81- 011-706-6216
E-mail: kishi@eng.hokudai.ac.jp

Abstract

In this study, behaviors of pedestrian in the sidewalk in commercial areas with street vendors activities is studied by means of a questionnaire survey. Respondents are grouped based on age (young, middle age, and old), gender (male and female), and the familiarity with the sidewalk (familiar and unfamiliar). Six statements relating to sidewalk conditions and four statements relating to pedestrian behaviors are asked to the respondents. Regarding sidewalk conditions, only one item found to be significant difference, namely, female middle age that familiar with the sidewalk more appreciate with safety from trips, slips, and falls. In terms of pedestrian behaviors, only two items found to be significant difference, namely, old male respondents that familiar with the sidewalk always want to look around commodities sold by vendors; and young female respondents that familiar with sidewalk always walk along at the sidewalk only for shopping than unfamiliar group. Generally, there are no significant behavior differences among the group of gender, age and familiarity of the sidewalk on vendors activities, however, it implies the needs for improve pedestrian facilities in order to enhance the safety and comfort without reducing their mobility and possibilities for social activity.

Keywords: Pedestrians, Behavior, Street Vendors, Sidewalk

1. Introduction

One of the observable facts about Bangkok is its street vendors. Many of the streets in the city have street vendors selling an array of items such as clothes, curios, electronic items and a wide variety of cooked and raw food. The municipal authorities in Bangkok have demarcated sites where street vendors can operate. In fact, these areas do not cover all sections of the city and hence the customers are not catered to. This has led to street vendors operating in unauthorized areas (Bhowmik, 2005).

Street vending is an important source of income for the urban poor. The number of street

vendors in the city increased rapidly after the monetary crisis of 1998 that affected most of the Southeast Asian countries. Many workers who lost their jobs as a result of the crisis and others who could not find jobs took street vending as a source of livelihood.

There is no evidence that street vendors cause vehicle traffic problems; they operate from pavements and not on the roads. In reality, the road space is not sufficient to accommodate the growing number of private vehicles and that is what causes traffic problems. Although vendor's activities do not cause vehicle traffic problem directly, their activities may influence pedestrian movements.

Vendors occupy some spaces in one side or both sides of sidewalk that are provided for walking movement. In some locations, street vendors may be interesting for pedestrians who enjoy their walking activities, such as in commercial or shopping districts. But vendor's activities also cause disturbance for pedestrian commuters, because they obstruct pedestrian movement in the sidewalk.

This study tries to investigate the impact of vendors activities along the sidewalk based on pedestrian perceptions. The aim of this study is to increase knowledge regarding pedestrians' behavior relating to vendors activities in commercial district. The differences among age group of young, middle age, and old pedestrians are studied. The differences between male and female, and the familiarity of pedestrians to the sidewalk are also observed.

2. Literature Review

Age categorization of road users have been studied in various research projects in recent years, especially in safety research. In general, older people concern in safety, comfort, and convenience of transport facilities, and their reaction time become increase for anticipating traffic situation. These age-related changes influence all daily actions, including behavior in traffic (Hine et al. 1996).

Environmental designs and urban form are the crucial components affecting pedestrian travel behavior. Pedestrian feeling of safety, comfort, and convenience can be increased using a proper design of pedestrian infrastructures without significant side effects on vehicle traffic. The facilities such as roadways, sidewalks, medians, pedestrian crossings and pedestrian bridges can encourage pedestrian traveling (Shriver, 1997., Carsten et al. 1998).

Bernhoft et al. (2007) investigated differences of preferences and behavior of pedestrian and cyclist by age and gender. The study revealed that older group of pedestrian significantly more cautious behavior to anticipate specific traffic situation than younger group. Generally, the younger groups tend to move fast and directly in traffic, and they more often argued that it was because they were in a hurry, whereas the older group more often argued that it was no inconvenience to wait or to stop.

3. Methodology

The pedestrian perception and behavior in the sidewalk is studied using a questionnaire. The respondents are randomly selected from pedestrians who walk along the sidewalk in Bang Rak area, Bangkok during 10.00 A.M – 6.00 P.M. Interviews are performed on November 3-4, 2009 and the total numbers of respondent are 334 pedestrians. Gender is not used as selection criteria, resulting in a greater sample of women than men.

The respondent's age is grouped into three categories, namely, young, middle age, and old. The definition of young pedestrians is as people aged 30 years and below. Middle age is as pedestrians aged between 31 years to 60 years. The old pedestrian is as people aged 61 years and above.

The respondent's familiarity with the sidewalk is categorized into two groups based on their frequency in using the sidewalk. The respondents are grouped as familiar with the sidewalk if they use the sidewalk daily or 3 times per week. Unfamiliar respondents are pedestrians who pass the sidewalk 2 times per week and below.

3.1 Construct

Six questions about perceptions as a pedestrian in the sidewalk are asked in the questionnaire, namely, (1) *I feel safe from vehicle traffic danger*, (2) *I feel safe from trips, slips and falls*, (3) *I think that the sidewalk flat enough to accommodate wheelchair users*, (4) *I can move freely without obstruction from physical features*, (5) *I have enough space to avoid the vendor's obstruction without decelerating my pace*, and (6) *I think that the total width of sidewalk is wide enough*. The respondents are asked to express their agreement of those statements regarding walking in the sidewalk with vendor's activities.

The questionnaire also includes statements of pedestrian agreement on their behavior regarding vendors activities, namely, (1) *I intend to buy something from street vendors*, (2) *I want to look around commodities sold by vendors*, (3) *I will still walk on the roadway (pavement) even when the sidewalk is very crowded*, and (4) *I will walk along this sidewalk only for shopping*. Finally, the last part of the questionnaire includes various questions regarding respondent's characteristic, such as age, gender, and frequency of using the sidewalk observed.

3.2 Data Analysis

Data analyses are performed based on respondent's characteristics with three steps. Firstly, respondents are grouped into their age classification (young, middle age, and old). Then, based on the each age class, respondents are separated by gender (male and female). The next step classifies the respondents based on their familiarity to the observed sidewalk (familiar and unfamiliar).

Statistically significant differences between the proportion of young, middle age, and old respondents, between the proportion of male and female walk as well as between the proportion of familiar and unfamiliar of the sidewalk regarding their answers to the questionnaire are based on χ^2 -tests ($p < 0.05$). Statistically significant differences related to this background information are based on cross-tabulation analyses using SPSS software ($p < 0.05$).

4. Result

The results reflect differences and similarities regarding respondent's preferences and behavior based on the young, middle age, and old, male and female as well as familiarity with the sidewalk observed.

4.1 Respondent characteristics

Fig. 1 through Fig. 3 illustrate characteristics of the total respondents by age, gender, and familiarity with the sidewalk. It can be seen in Fig. 1 that most of the respondents are young age. Fig. 2 shows that the number of female respondents is higher than male. Then, from Fig. 3 it can be seen that most of the respondents are familiar with the sidewalk observed.

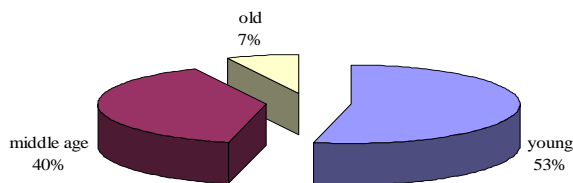


Fig. 1 Respondent's age

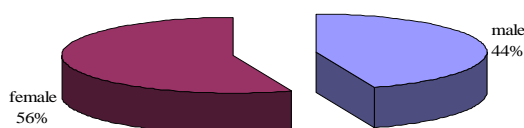


Fig. 2 Respondent's gender

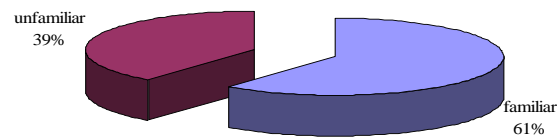


Fig. 3 Respondent's familiarity with sidewalk

Results from the questionnaire reveal that about 66% of the young pedestrians are familiar with the sidewalk, 58% of the middle age pedestrians are familiar, and 35% of the old pedestrians are familiar. The gender composition of each age group is as follows, young respondent: 46% male, 54% female, middle age: 42% male, 58% female, and old respondents: 48% male, 52% female.

4.2 Preferences and behavior of pedestrians

4.2.1 Condition of importance for walking

Regarding sidewalk condition, there are no significant age, gender, and familiarity differences in following five sidewalk conditions: (1) *Safe from vehicle traffic danger*; (2) *Sidewalk can accommodate wheelchair users*; (3) *No obstruction from physical features*; (4) *Sufficient space to avoid obstruction from the vendors*; and (5) *Sidewalk width is sufficient*

However, a significantly difference of the female middle age that familiar with the sidewalk more appreciate with safety from trips, slips, and falls ($\chi^2 = 4.76$, $df = 1$, $N = 77$, $sig = 0.038$). But, there are not significant differences proportion of young male ($\chi^2 = 1.731$, $df = 1$, $N = 82$, $sig = 0.223$), young female ($\chi^2 = 2.026$, $df = 1$, $N = 97$, $sig = 0.182$), middle age male ($\chi^2 = 0.22$, $df = 1$, $N = 55$, $sig = 0.1$), old male ($\chi^2 = 2.037$, $df = 1$, $N = 11$, $sig = 0.455$), and old female ($\chi^2 = 0.8$, $df = 1$, $N = 12$, $sig = 0.1$).

Table 1 shows the result of chi-square test of each statement for young, middle age, and old respondent.

4.2.2 Behavior regarding vendors activities

Chi-square test is performed in four statements regarding pedestrian behavior. Significant familiarity differences can be found in two items. First, familiar old male pedestrian is significantly more likely than unfamiliar groups to wants to look around commodities sold by vendors ($\chi^2 = 7.543$, $df = 1$, $N = 11$, $sig = 0.015$). Then, the

young female pedestrian who is familiar with the sidewalk is reported significantly always walk along at the sidewalk only for shopping ($\chi^2 = 5.186$, $df = 1$, $N = 97$, $sig = 0.031$).

The other behavior categories show that there are no significantly differences among the groups of pedestrian, as can be seen in Table 2.

Table 1. The result of chi-square test of conditions considered important for walking

Age group	Gender	I feel safe from vehicle traffic danger			I feel safe from trips, slips and falls		
		Chi square	N	Sig.	Chi square	N	Sig.
Young	Male	0.570	82	0.612	1.731	82	0.223
	Female	0.783	97	0.494	2.026	97	0.182
Middle age	Male	2.568	55	0.147	2.200	55	0.112
	Female	1.582	77	0.239	4.760	77	0.038
Old	Male	1.061	11	0.545	2.037	11	0.455
	Female	1.029	12	0.523	0.800	12	0.101

Age group	Gender	I think that the sidewalk is flat enough to accommodate wheelchair users			I can move freely without obstruction from physically features (phone boxes, column, bench, etc)		
		Chi square	N	Sig.	Chi square	N	Sig.
Young	Male	0.330	82	0.150	2.800	82	0.110
	Female	1.397	97	0.283	0.066	97	0.817
Middle age	Male	0.220	55	0.120	0.308	55	0.731
	Female	0.924	77	0.463	1.975	77	0.199
Old	Male	2.037	11	0.455	2.440	11	0.150
	Female	1.480	12	0.160	3.273	12	0.250

Age group	Gender	I have enough space to avoid the vendor's obstruction without decelerating my pace			I think that the total width of sidewalk is wide enough		
		Chi square	N	Sig.	Chi square	N	Sig.
Young	Male	0.565	82	0.476	0.805	82	0.454
	Female	0.137	97	0.824	0.400	97	0.120
Middle age	Male	1.111	55	0.348	0.629	55	0.537
	Female	1.917	77	0.224	2.812	77	0.137
Old	Male	1.061	11	0.545	2.213	11	0.242
	Female	3.273	12	0.250	0.364	12	0.130

5. Discussion

Generally, the results of the study reveal that there are no significant differences among pedestrians in the sidewalk. Only three items found to be significant difference in this study.

First, the pedestrians in the group of female middle age who are familiar with the sidewalk are found to have more appreciation on safety from trips, slips, and falls than unfamiliar pedestrians. The proportions of workers in this group are 52%. It can be understood that because using the

sidewalk as daily trips or as commuter, they give more attention to their safety. This group needs proper walking facilities to support their mobility. For this group, moving fast and saving the time are more important than enjoy walking and sightseeing along the sidewalk.

The old male pedestrians who are familiar with the sidewalk are found to want to look around in commodities sold by vendors than unfamiliar pedestrians. The old age respondent is the group that consists of retirement person or the person that enjoy their living. In fact, this group is identified as

the group that enjoy with the vendor's activities and 58% of the trip purpose is for shopping and recreational.

Regarding walking in the sidewalk for shopping only, the young female that familiar with the sidewalk is found to be significantly different with unfamiliar group. Almost 47% of this group are identified as shopping of their trip purpose, although lot of them as students (56%) most of the respondents are interest to buy something in the vendors during their trip as a commuter.

Table 2. The result of chi-square test of pedestrian behavior

Age group	Gender	I intend to buy something from street vendors			I want to look around commodities sold by vendors		
		Chi square	N	sig	Chi square	N	sig
Young	Male	2.992	82	0.094	0.875	82	0.428
	Female	1.411	97	0.120	0.183	97	0.820
Middle age	Male	0.338	55	0.584	0.153	55	0.750
	Female	0.259	77	0.634	0.179	77	0.803
Old	Male	2.396	11	0.242	7.543	11	0.015
	Female	1.333	12	0.509	0.364	12	0.130

Age group	Gender	I will still walk on the roadway (pavement) even when the sidewalk is very crowded			I will walk along this sidewalk only for shopping		
		Chi square	N	sig	Chi square	N	sig
Young	Male	1.239	82	0.334	0.526	82	0.603
	Female	0.561	97	0.531	5.196	97	0.031
Middle age	Male	2.568	55	0.147	0.424	55	0.584
	Female	0.374	77	0.606	1.628	77	0.253
Old	Male	2.396	11	2.420	0.200	11	1.114
	Female	1.029	12	0.523	1.029	12	0.523

6. Conclusion

The results of this study contribute to a better understanding of the behavior of sidewalk users and should be considered when implementing physical countermeasures as well as campaigns and information for sidewalk users. Although this research reveals that in general there are no significant differences among the groups of different gender, age and familiarity of the sidewalk regarding their perception and behavior on vendors activities, it implies the needs for infrastructure improvement in order to enhance the safety and comfort for the sidewalk users without reducing their mobility and possibilities for social activity.

Further research should be performed in some different locations to compare the kind of vendors activities and pedestrian behavior.

7. Acknowledgment

The authors would like to thank JICA for its project of Southeast Asia Engineering Education Development Network (SEED-Net) for research funding.

References

- [1] Bhowmik, S.K. (2005). *Street Vendors in Asia: A Review*, Economic and Political Weekly May 28-June 4
- [2] Hine, J., & Russel, J. (1996). Impact of traffic on pedestrian behaviour: Assessing the traffic barrier on radial routes. *Traffic Engineering & Control*, 37(2), 81–85.
- [3] Shriver, K. (1997). Influence of environmental design on pedestrian travel behavior in four Austin (TX, USA) neighborhoods. *Transportation Research Record*, 1578, pp 65–73.
- [4] Carsten, O. M. J., Sherborne, D.J., Rothengatter, J.A. (1998). Intelligent traffic signals for pedestrians: evaluation of trials in three countries. *Transportation Research Part C*, 6, pp 213–229.
- [5] Bernhoft, I. M., Carstensen, G. (2007). Preferences and behavior of pedestrians and cyclists by age and gender. *Transportation Research Part F*, Traffic Psychology and Behaviour, 11(2), pp. 83-95.