


Differences in Patterns and Factors Influencing Preference and Willingness to Pay for Physical Developments of a Streetscape in the Old Town of Chiang Mai, Thailand

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ABSTRACT

 This paper identifies the influences of environmental characteristics and personal factors on preference and willingness to pay (WTP) for the physical development of a streetscape, and the relationship between preference and WTP. A questionnaire with computerized montage pictures portraying streetscape development solutions was used to collect data from 440 respondents in Chiang Mai city. Tobit models were formed to analyze the preference and WTP dependent variables with environmental and personal characteristic variables. The results revealed differences in patterns as well as influencing factors of preference and WTP for the development solutions. Preference was significantly influenced only by environmental variables, while WTP was significantly influenced by preference and the personal characteristic variables.

Keywords: *physical development, streetscape, preference, willingness to pay (WTP), old town Chiang Mai*

INTRODUCTION

As a historic and cultural travel destination, old town Chiang Mai's appearance and functionality of public spaces, especially pedestrian walkways and streetscapes, are unsatisfactory compared to other world-class destinations. The current condition of the streetscape is substandard with a variety of overhead wiring, signs and storefront products leaving the sidewalks unsightly, obstructed and nearly impossible to navigate. Trees and other vegetation have no room to grow vertically or horizontally. To improve aesthetic and functional qualities of the streetscape, major physical improvement projects are needed. These projects would require funds well beyond the regular operational budget, which only can pay for maintenance works rather than significant improvements (Chiang Mai City Municipality, 2011). While specially distributed funds from the central government are rare, raising funds is a way to help increase the budget for streetscape development. Several payment methods are available and have been used in several countries to collect funds from residents and non-residents (Kaosa-ard et al., 1995). The possibility of fund collection from the public depends on an understanding of how, how much, and on what conditions they are willing to pay for streetscape development. For a development solution, there is a range of development elements to choose from. However, which elements should be prioritized over the others have not been clarified.

Although the cost of a streetscape's physical development from materials and construction can be calculated, the focus of this research is not on the actual cost, but on people's perceived value of the streetscape improvement that can be translated into payment amounts. Knowing what costs people are willing to pay for streetscape development can help city administrators distribute reasonable amount of funds for physical developments. They can then prioritize development solutions in accordance with what is most important to people.

Previous studies have been used as a basis for urban design and have influenced streetscape elements based on people's preferences for the environment (Nasar, 1997). However, preference alone may not be a concrete measure for the administrator to justify costly major developments. Willingness to

Pay (WTP) is a form of measurement that utilizes stated preference procedures to collect people's reaction towards the environment. People need to make trade-off judgments when deciding to pay to receive the benefits from the desired environment. Therefore, WTP can provide a stronger measure of people's attitudes for the development that reflect value. However, previous WTP studies always focus on overall environment rather than specific elements. There is still a need for clarification of: contributions of specific elements on the value of streetscape; the patterns and the influences of all the factors on preference and WTP; and relationship between preference and WTP in the same context.

Therefore, the objectives of this research are to identify and compare factors influencing preferences and willingness to pay. It will also identify the preferential influences on willingness to pay for physical improvements of a streetscape. Understanding the influencing factors on preference can help designers and planners create an attractive physical development scheme. While noting and understanding factors influencing the willingness to pay for the streetscape's physical development can help planners and administrators generate policies using funding plans that correspond with their residents' preferences. Therefore, a streetscape development project should consider not only the preference, but also the willingness to pay to enable the possibility for fund collection to help cover the cost.

REVIEW OF LITERATURE

Study approaches

Previous research provides several approaches to study preference as well as willingness to pay (WTP) for the environment. Preference is an overall evaluation of the environment that people respond to from their feeling, which could yield implications for physical developments (Kaplan & Kaplan, 1983; Nasar, 1998), and is widely applied as research measurement (Kaplan and Kaplan, 1995). WTP is also an overall judgment that includes preference and the use values that people have perceived from the environment (Kaosa-ard, et al., 1995).

Preference studies have been conducted in a variety of environments, from natural landscape (Kaplan & Kaplan, 1995) to urban contexts (Nasar, 1997). These studies utilize stated preference to determine how much people like the environments that are presented. Images of the environments have been used as surrogates in the studies to solicit people's reactions toward the environment, and this technique has proven to yield results similar to those obtained while using real environments (Danial & Meitner, 2001; Stamps, 1999). Measurement of the stated preference can be collected through rating, ranking, selecting, or accepting the only provided choice.

WTP study is a form of the Contingent Valuation Method (CVM) that is used to evaluate a product that has no market price (Glover, 1998). CVM focuses on the overall economic value of the environment that people perceive based on the benefits derived from the environment. The benefits can be distributed into use and non-use values. Use value can be divided into direct, indirect, and future use values, while non-use value comprises existence value and bequest value (Kaosa-ard, et al., 1995). Therefore, different respondents may perceive different types of use and assign different values to the same environment. These values can be measured in terms of Willingness to Pay (WTP). WTP uses the highest cost that a person is willing to pay to receive the benefit from the environment to determine the value of that environment to him/her. The cost of that environment can be determined using aggregated individual valuations (Kaosa-ard, et al., 1995).

The WTP study is based on the respondents' perception of the environments via stimuli or simulated images and/or verbal descriptions clarifying conditions and changes for the respondents to correctly evaluate and make decisions (Boxall, et al., 1996). WTP questions collect the respondents' stated preference by asking the respondents to give the exact price, accept the proposed solution with a price, select alternative solutions with attached values, and rate or rank the solutions with attached prices (Glover, 1998). Many of the WTP studies include the status quo solution (no development and not paying for any of the solutions) as a comparison (Boxall, et al., 1996). WTP studies have been conducted with a variety of environments, ranging from rural-agricultural landscapes (Sayadi, et al.,

2005, 2008) to streetscapes (Fukahori & Kubota, 2003).

Normally, preference studies focus on the effects of the different characteristics or elements of the environment, while WTP studies focus on the overall value of the environment rather than on separate elements. The approaches are similar since preference and WTP are measured by stated preference and are influenced by the characteristics of the environments and the personal characteristics of the respondents. Therefore, it is of interest to conduct preference and WTP studies together in the same context, which allow comparison.

Influencing environmental factors

Preference and WTP study use pictures as simulation. Environmental variables of interest are included as contents in the pictures. While influences of specific elements on WTP are not commonly provided, influences of contents in the scenes on preference are concluded by their prominence and meanings of the form (Kaplan & Kaplan, 1995). Main features of the form in the natural landscape, such as a mountain or a lake, and city elements, such as a landmark, a node, an edge, a path and a district, helping with cognitive map, are well recognized and preferred (Kaplan & Kaplan, 1995; Lynch, 1960; Nasar, 1998). Positive natural contents suggesting restorative meaning such as vegetation and water bodies are innately preferred (Kaplan & Kaplan, 1995). Manmade contents portraying a positive meaning such as new buildings, well-maintained areas, and well-organized products are preferred, while contents suggesting a negative meaning such as low -maintenance areas, dilapidated buildings, disorganized product display, obtrusive signs, and overcrowded areas are not preferred (Herzog & Shier, 2000; Lekagul, 2003; Nasar, 1998; Nasar & Hong, 1999).

In urban contexts, the relevant environmental factors that could be used to enhance preference are identified as naturalness, upkeep, openness, order and historic significance (Nasar, 1998). Naturalness in urban context is normally represented by vegetation or green contents that have restorative meaning. Vegetation is always preferred in urban

contexts (Nasar, 1997), especially in the streetscape (Sheets & Manzer, 1991). Among the different types of vegetation, trees are the most effective for preference (Todorova, et al., 2004). Different types, sizes, intervals, and shapes of trees could influence preference and perceived value (Fukahori & Kubota, 2003; Summit & Sommer, 1999; Todorova, et al., 2004). Therefore, adding trees to the streetscape would increase an overall green, shady feeling and the perception of well-being, thus increasing preference, use value and WTP.

Upkeep is a positive content represented by evidence of good maintenance, cleanliness, and new elements. On the other hand, low-maintenance areas and dilapidated buildings are not preferred and may suggest high rates of crime (Herzog & Gale, 1996; Nasar, 1998). In urban streetscape, disorganized elements such as disordered wiring, obtrusive signs, and other elements are less preferred (Nasar, 1998; Nasar & Hong, 1999), since they may be too complex and low on coherence and legibility. Similarly, order aids understanding and increases preference (Kaplan & Kaplan, 1995; Nasar, 1997). Order of streetscape can be visible from the line-up of the buildings, the good organization of the building facades and ornaments, and other street elements (Nasar, 1997).

Upkeep and order can be enhanced by organizing the disordered and negative elements on the streetscape namely electrical poles and wires, various signs and products from the storefronts. Electrical poles and wires are identified as negative and unfavorable in the city (Nasar, 1998), and perceived by the residents as a negative feature for aesthetics, property value, health, and safety in the residential context (Priestly & Evans, 1996). As for design, the type and interval of the light posts, as well as the type and size of the lamps, are found influencing preference and perceived value (Fukahori & Kubota, 2003).

Signs and other obstructive items, including parts of infrastructure and utilities, are apparent on the sidewalks and are identified in research as negative and unfavorable items (Nasar, 1998). The obtrusiveness of all the signs in the streetscape, resulting from the contrasts in the sizes, shapes,

and colors of the signs, is a negative feature for preference (Nasar & Hong, 1999). Organizing these items by removing poles and wires as well as the obtrusive signs could increase the upkeep, order, and, finally, preference for the streetscape.

Openness is a spatial quality resulting from distances and visual organization between elements and spatial boundaries. In streetscape contexts, openness is effected by the width of the streets and sidewalks as well as the height of the buildings (Nasar, 1997). Large amounts of unorganized elements such as poles and wires, obtrusive signs, and other disordered items on the too-narrow sidewalks reduce openness and suggest crowdedness, leading to low preference (Nasar, 1998; Nasar & Hong, 1999).

Openness can be enhanced by removing the obstructive elements and widening the walkways. The width of the pedestrian walkways influences the preferences and decisions to walk for the purpose of exercising (Naderi & Raman, 2005), while the colors and sizes of the paving materials influence preference and perceived value (Fukahori & Kubota, 2003). Wider and clearer pedestrian walkways could increase openness and offer more perceived functions and spaces for circulation and recreational activities, which could increase preference and perceived use value.

Historic significance can influence preference and can be achieved with the presence of historic buildings and places (Nasar, 1998). The historic buildings may also be recognized as landmarks, and may, convey social meaning such as religious, historic events and associated persons (Nasar, 1998). The historic significance of a place could be enhanced by emphasizing the historic building, which becomes the focal point or the landmark that signifies its historical meaning, which could increase preference.

Although the influential elements for WTP may not be sufficiently informed; similar influences from preference studies are informed and may be expected in a WTP study as it utilizes stated preference procedure. Finally, the environmental variables that could be used in preference and WTP studies of streetscape development include: presence of trees; absence of wires and

poles; absence of signs and other elements; and expansion of the sidewalks. In addition, historical significance of the context or elements could also be considered.

Personal characteristic factors

Preference responses are the result of interaction between the person and their environment. People are individually different but can be classified into groups by similarity of personal characteristics and by sharing patterns of preference. Thus, leading to agreeable solutions for physical development that designers and planners need to value (Nasar, 1998). Similarities in preferences established across groups comes from evolutionary factors such as preference for vegetation and prospect and refuge views (Appleton, 1975; Kaplan & Kaplan, 1995). Preferences for the environment differ generally due to culture-based factors, which are familiarity, culture groups, and knowledge (Kaplan & Kaplan, 1995). Differences in WTP are caused by the different use values that different groups of people have (Kaosa-ard, et al., 1995).

Familiarity can cause differences in preference due to the different levels of information that people have regarding their environment as well as their relationship with the place (Kaplan & Kaplan, 1995). Those who are more familiar with the place know more details and have more long-term memory about the place, all of which can affect their preference (Nasar, 1998).

Familiarity can positively or negatively affect preference, not only with regard to information but also with regard to the feeling of monotony or novelty (Kaplan & Kaplan, 1983; Purcell, et al., 1998). Local residents and the visitors not only have different levels of information and familiarity but also different types and levels of uses. WTP studies also found that residents and visitors, both possibly direct users, have different preferences as well as WTP (Rambonilaza & Dachary-Bernard, 2007). Different user groups (tourists, residents, and local administrators) were also found having different preferences and value perceptions (Kaosa-ard, et al., 1995; Rambonilaza & Dachary-Bernard, 2007; Sayadi, et al., 2005). Similar to familiarity, use

values were measured in various studies as types of relationships with the place, such as being a living or working place, being residents or visitors, or by frequency or duration of involvement (Kaosa-ard, et al., 1995; Kaplan & Kaplan, 1995; Nasar, 1998; Rambonilaza & Dachary-Bernard, 2007; Sayadi, et al., 2005). Personal characteristics could be distributed based on demographic profiles, cultural backgrounds, social statuses, or intentions as regards the environment (Kaplan & Kaplan, 1995; Nasar, 1998). Gender and age are rarely found to influence preference but are expected to have influences on WTP, and were included in several preference and WTP studies (Alvarez-Farizo & Hanley, 2002; Herzog, et al., 2000; Kaosa-ard, et al., 1995; Kaplan & Kaplan, 1995; Nasar, 1997; Sayadi, et al., 2005; Stamp, 1999; Stamp & Nasar, 1997). Children and adults are found to have different preferences for natural environments (Herzog, et al., 2000).

The respondents' social status affects preferences for their environment by different interpretations of social meanings (Nasar, 1998). Differences in the preference for houses were found among groups of people with different social status such as education, occupation, and income (Nasar & Kang, 1999; Purcell, et al., 1998). People with different social status may have different WTP values due to the affordability aspect since they have to consider how much they can pay before stating their WTP. In addition, those who have dependents may have concern with non-use such as bequest value regarding their children (Kaosa-ard, et al., 1995). The variables related to social status that are expected to influence WTP and have been included in previous studies are marital status, number of children, household size, education, and income (Alvarez-Farizo & Hanley, 2002; Kaosa-ard, et al., 1995; Rambonilaza & Dachary-Bernard, 2007; Sayadi, et al., 2005).

Special knowledge and expertise factors are among the most frequently found significant differences in environmental preferences. Recent knowledge can change perceptions of and preferences for the environment. Hikers who receive immediate knowledge about the hiking trail have different preferences from those who do not (Kaplan & Kaplan, 1995). Similarly, the respondents were found to prefer

the very same residential buildings differently after changing buildings' labels. (Nasar, 1998).

Long-term knowledge such as education, training, or expertise is always a source of difference in the preference for the environment. Designers and laypersons are different in their perceptions and preferences for the built environment due to their emphasis on different kinds of meanings (Nasar, 1998). Education or training can shape experience and perception. A study found that design students' evaluation of architecture changes over the course of their education and, eventually, become similar to their architect teachers (Whitfield & Wiltshire, 1995). Experts in environmental studies and landscape design are also found having different perceptions and preferences for the environment as compared to laypersons (Kaplan & Kaplan, 1995). The variables related to education and training such as levels of education and occupation are also expected to affect WTP and have been included in various studies (Alvarez-Farizo & Hanley, 2002; Kaosa-ard, et al., 1995; Sayadi, et al., 2005).

Although previous literature confirms high correlations of preferences for the environment among different groups tested; some group differences could still be of interest such as age, ethnicity, special interests and expertise, especially in designed context (Stamps, 1999). Moreover, differences in WTP among most groups were not intensively covered by previous research and therefore worth including in the study to test their influences on preference and WTP. Personal characteristics variables which are expected to influence preference and WTP are included in this study are as follows:

- familiarity and use related variables include place of residence and work
- resident status, years of residency, and frequency of visit
- social status variables included age, gender, marital status, number of dependents, household members, income
- reasons to visit
- variables related to knowledge include level of education and occupation.

METHODS

From the literature review, it has been understood that preference and willingness to pay are influenced by environmental and personal characteristics. The following have been hypothesized: (1) Environmental and personal characteristic factors influence preference and WTP; (2) preference for the development solution positively influences WTP; and (3) the patterns of preference and WTP for development solutions, and the influential variables for preference and WTP will be similar.

Research design

The hypotheses are tested by identifying the relationships between the environmental and personal characteristic variables and preference and then WTP. The preference score is entered as an independent variable into the WTP model to identify its relationship with WTP. The preference and WTP models can be compared along with the preference and WTP measurement scores for development solutions in order to determine similarity.

“Preference” is assigned when people see the development solution and decide how much they like it and is measured on a scale of 1 to 10. WTP is measured by “donation amount,” which is assigned when they decide how much they should give to the development. This is measured by the amount of money, in Baht, that the respondents would give as a one-time donation to the development project. The personal characteristic variables are measured and analyzed as categorical data except for those that contain real numbers of persons, money and years, which are measured and analyzed on a scale. The list of variables and measurements is displayed in Table 1.

Table 1: Variables in analyses

Variable Name	Definition	Data Level	Attributes
Preference	How much respondent likes solution in scene	Scale 1–10/Scale	1 = not preferred, 10 = very much preferred
Donation Amount	Amount of money respondent is willing to donate to development project	Scale	Amount of donation, in Baht
Absence of Wires	Electrical wires and posts are eliminated from original scene	Dummy code	0 = presence, 1 = absence
Presence of Trees	Big trees were added on both sides of sidewalk	Dummy code	0 = absence, 1 = presence
Absence of Signs	Signs and other obstructive elements are erased from scene	Dummy code	0 = presence, 1 = absence
Wider Sidewalks	Increase width of sidewalks by 1.5 meters on each side	Dummy code	0 = absence, 1 = presence
Age	How old the respondent is	Category/Dummy code	0 = 25 and under; 1 = over 25
Gender	Gender of the respondent	Category/Dummy code	0 = male, 1 = female
Marital Status	Whether respondent is married, single, or in other statuses	Category/Dummy code	0 = other, 1 = single
No. of Children	Number of children respondent has	Scale	Actual number
No. of Household Members	Number of members living together in same house	Scale	Actual number
Household Income (Baht)	Aggregated income earned by every member in household	Ordinal/Scale (using mean of each income bracket)	5,000; 7,000; 12,500; 17,500; 22,500; 27,500; 32,500; 37,500; 45,000; 55,000; 65,000; 70,000
Education	Highest level of education completed by respondent	Category/Dummy code	0 = lower than undergrad, 1 = undergrad or higher
Occupation 1 (Salary)	Occupation of respondent who may be working as officers or employees, and receive salary	Category/Dummy code	0 = others, 1 = government officers, company employees
Occupation 2 (Self-employed)	Occupation of respondent who owns business or whether self-employed	Category/Dummy code	0 = others, 1 = business owner, freelance business
Chiang Mai Resident	Respondent who lives primarily in Chiang Mai	Category/Dummy code	0 = no, 1 = yes
No. of Years in Chiang Mai	Number of years respondent has been living in Chiang Mai	Scale	Actual number
Home Location	Respondent's home location	Category/Dummy code	0 = outside old city 1 = inside old city
Work Location	Respondent's workplace	Category/Dummy code	0 = outside old city 1 = inside old city
Frequency of Visit	Number of times respondent visits studied area per month	Category/Dummy code	0 = less than 16 times a month, 1 = 16 times a month or more
Reason for Visit	Main reason respondent visits studied area	Category/Dummy code	0 = others, 1 = go home or go to work

Environmental surrogates

The instruments used in the study include a questionnaire and a set of accompanying pictures portraying developmental solutions of a selected area in the historic center of the old city. The chosen area for this research is a part of Rajadamnern Road, which is a major road on the east-west axis, connecting the Eastern Gate to Wat Phra Singh, the main historic temple in the center of the city. The road is about 14 meters wide, with pedestrian walkways on both sides with varying widths, from less than 1 meter to more than 3 meters.

The digital pictures used for this investigation are taken at eye level from the center of the road at about 100 meters facing toward the front gate of Wat Phra Singh with a relatively wideangle lens (around 35 mm equivalent) to allow full and equal visibility of both the sidewalks. The original scene portrays Wat Phra Singh Temple in the middle and the streetscape on both sides, leading to the front gate of the temple in the middle (Figure 1).

The selected environmental variables presented to the respondents are otherwise identical scenes with a single change to the original image (Figure 1). The single change is presented as follows: absence of wires (Figure 2), presence of trees (Figure 3), absence of signs (Figure 4), and wider sidewalks (Figure 5). The original picture was digitized and montaged to portray each of the four proposed alterations on one picture (Figure 2, Figure 3, Figure 4, and Figure 5) to compare with the original picture without any development (Figure 1). The pictures were color-printed in pairs, with the original scene and one of the proposed development solutions on each sheet of an A4 paper. Therefore, there are four different sets of pictures to accompany the questionnaire (Figure 1 and Figure 2, Figure 1 and Figure 3, Figure 1 and Figure 4, and Figure 1 and Figure 5).



Figure 1:
The current condition without development.



Figure 2:
The condition showing “absence of wires.”



Figure 3:
The condition showing “presence of trees.”



Figure 4:
The condition showing “absence of signs.”

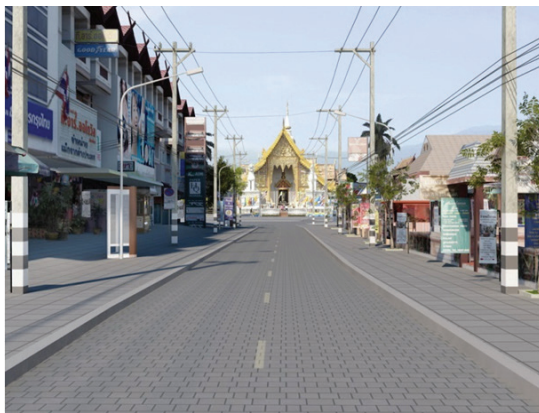


Figure 5:
The condition showing “wider walkways.”

Questionnaire survey

The questionnaire comprises two parts. The first part measures the “preference” and “donation amount.” The second part asks for the respondent’s information about the personal characteristic variables. The questionnaire was pre-tested with 40 non-sample respondents. The pre-test verified the appropriate sizing of the images, how well the respondents were able to recognize the improvement in each image, and how they would rate and assign value for donation, as well as other questions to be answered. After analyzing these results, the questionnaire was adjusted to be more appropriate and to include all the possible answers.

The sample size was 440 respondents which meets the minimum requirements of a variety of statistical procedure including the Tobit Model (Hsieh, et al., 1998). Each set of the questionnaire including a set of pictures depicting one of the four development solutions was systematically alternated and handed out to the respondent in the four public locations namely Rajadamnern Road, inside the old city moat, outside the old city moat but in the Mueang Chiang Mai district, and outside the district. Therefore, 110 respondents would evaluate each of the four development solutions combining to the total of 440 respondents.

The collected questionnaires were coded and entered onto a spreadsheet, and then analyzed using statistical packages. “Preference” and “donation amount” were analyzed using the Tobit Model to identify the relationships between the multiple independent variables and each dependent variable. Like the Multiple Regression Model, the Tobit Model is used to identify the linear relationships between a scale dependent variable and different types of independent variables. The Tobit Model is determined to be more suitable for an analysis, in which dependent variable is censored data (incomplete or no negative value) (Hsieh, et al., 1998). The same set of independent variables — 3 environmental variables and 15 personal variables — were included in the analyses to identify the influences of the independent variables on each dependent variable. In addition, the “preference” score was also included as an independent variable in the Tobit Model analysis of “donation amount.” For each analysis, the physical development variables that had the lowest mean of “preference,” and the lowest mean of “donation amount” were used as bases for comparison. The variables and attributes in the models are displayed in Table 1.

RESULTS

The results are reported by dependent variables, “preference” and “donation amount.” For each set, the results displayed have been obtained by descriptive analysis and by using the statistical models.

Preference

Table 2 displays the descriptive statistics for the “preference” mean score. From the four environmental variables, the average “preference” scores out of 10, from the highest to the lowest, are presented in the third column.

In Table 3, the Tobit Model shows that the hypothesis that environmental and personal characteristic variables influence “preference” is accepted only for environmental variables part. Since the two environmental variables, “presence of trees” and “absence of wires” have positive significant influences on “preference,” while “wider sidewalks” and the personal characteristic variables have no significant influence on “preference.” The respondents preferred the solution of planting big trees and placing the wires underground significantly more than the solution of removing the signs.

This can be interpreted to mean that if the other variable is held constant, the “presence of trees” could increase preference by 0.86 of the scale, while the “absence of wires” could increase preference by 0.54 of the scale. This is consistent with the previous findings that environmental factors are the main source of preference for the environment (Kaplan & Kaplan, 1995; Nasar, 1997; Stamps, 1994). The fact that “Presence of trees” is the most preferred, and the highest influential variables proved that trees are always preferred as nature in urban contexts (Kaplan & Kaplan, 1995; Nasar, 1998; Sheets & Manzer, 1991). This supports the theoretical viewpoint that nature is preferred across all groups as a survival source based on the evolutionary view (Kaplan & Kaplan, 1995) as well as corresponding with previous findings that trees provided a variety of benefits perceived by the respondents (Jones, et al., 2012).

Table 2: Preference by development solutions

Physical Development Variable	Rank	Preference Means (SD)
Presence of Trees	1	7.85 (1.74)
Absence of Wires	2	7.53 (1.81)
Wider Sidewalks	3	7.03 (2.15)
Absence of Signs	4	6.96 (1.92)
Total		7.34 (1.94)

Note: N = 440, 110 per condition.
 $F(3, 440) = 5.42, p = .001, h^2_p = 0.04$

Table 3: Tobit model of preference

Variable	Coefficient	SE	Marginal Effect	SE
Constant	7.53***	0.30	6.66***	0.26
Absence of Wires	0.61**	0.29	0.54**	0.25
Presence of Trees	0.98***	0.29	0.86***	0.26
Wider Sidewalks	0.10	0.29	0.09	0.25

Note: Dependent variable: “preference.”
 Log Likelihood Function = -895.99, N = 440
 Significant at 0.05; *significant at 0.01
 $F(6, 440) = 2.11, p = .15$

Possibly, trees may be preferable not just for being natural content, but also for obscuring the presence of electrical wires and other undesirable features, making the overall aesthetic quality of the streetscape better. Removing the wires not only increases upkeep and order, but also reduces excessive complexity (Nasar, 1997) and perceptions of negative content (Priestly & Evans, 1996), thus increasing preference.

Donation amount

332 out of 440 respondents (75%) donated. The range of the “donation amount” laid between 10 Baht and 2,000 Baht (0.3–60.6 USD). The most frequently donated amount was 100 Baht (3.03 USD), while the average was 168.26 Baht (5.1 USD).

As can be seen from Table 4, “wider sidewalks” received the highest mean of the “donation amount,” at 191.67 Baht (5.8 USD). The “presence of trees” received the second highest mean of the “donation amount,” at 164.19 Baht (4.98 USD), followed by the “absence of wires” which received a mean of “donation amount,” at 160.16 Baht (4.85 USD), and the “absence of signs,” at 159.90 Baht (4.85 USD).

From Table 5, it can be observed that the Tobit model of the “donation amount” shows that the significantly influential variables under the 0.01 level are “preference,” marital status, number of children, household income, and home location. The hypothesis that environmental and personal characteristic variables influence WTP is accepted only for the part of personal characteristic variables. It can be seen that four personal characteristic

Table 4: Donation amounts by development solutions

Physical Development Variable	Rank	Number of Responses	Mean of Donation Amount (SD)
Wider sidewalk	1	75	191.67 (301.71)
Presence of trees	2	86	164.19 (214.56)
Absence of wires	3	93	160.16 (249.74)
Absence of signs	4	78	159.90 (217.86)
Total		332	168.26 (246.40)

Note: 1 USD = around 33 THB.

$F(3, 332) = 0.295$, $p = 0.83$, $h^2_p = 0.003$

Table 5: Tobit model of donation amounts

Variable	Coefficient	SE	Marginal Effect	SE
Constant	28.16	68.06	22.16	53.64
Preference	25.14***	7.37	19.78***	5.82
Marital status	-112.15***	32.32	-88.26***	25.52
Number of children	61.41***	17.19	48.33***	13.58
Household income	1.61***	0.56	1.27***	0.44
Home location	-121.02***	24.06	-95.24***	19.06

Note: Dependent variable: “donation amounts.”

Log Likelihood Function = -2248.53, N = 332

Significant at 0.05; *significant at 0.01

$F(11, 332) = 211.40$, $p = 0.11$

variables significantly influence “donation amount,” with the exception that no environmental variable has a significant influence on the “donation amount.” The hypothesis that preference positively influences WTP is also accepted because the variable “preference” in the Tobit model significantly influences “donation amount.”

Three variables have positive influences on the “donation amount.” The most positively influential variable is the number of children, followed by “preference,” and household income. The other two have negative influences. The most negatively influential variable is home location, followed by marital status. This can be interpreted to mean that if the other variables are held constant, the respondents who have more children donated 48 Baht more per child compared to those who do not have any, or have fewer children. The respondents who have higher preference for the development solution donated 20 Baht more for each preference scale they rated. The respondents who have higher household income donated 1.27 Baht more for each additional Baht of household income. At the same time, the respondents who live in the old city area donated 95 Baht less than those who live outside. Moreover, the single respondents donated 88 Baht less than the others.

As for the personal characteristic variables, the more children the respondents have, the more they donate. The respondents who are married also donated greater amounts than those who are single. This may suggest that the respondents who have families perceive additional bequest value in the potential development, possibly for the welfare of their children. Otherwise, it is more likely that those who are married and have children, generally, may be well established and are better off financially. This coincides with the fact that the respondents who have higher household income donated greater amounts than those with lower household income. This corresponds with previous findings that income influences the amount of WTP (Liebe, et al., 2011; Rambonilaza & Dachary-Bernard, 2007).

Those who live in the old city donated less than those who live outside, in spite of their higher direct use opportunity. It may also be that they perceive a higher cost to the disruptions entailed in the

developments. Since most businesses in the old city are tourism related and possibly belong to the non-residents, the old city residents might not perceive enough benefits from the physical developments. On the contrary, the business owners might be living outside the old city. Otherwise, those who live outside the old city may perceive other non-use values such as bequest or existence value. This is similar to the differences found in previous WTP researches that non-users and indirect users are willing to pay more than direct users (Rambonilaza & Dachary-Bernard, 2007).

As far as the environmental variable is concerned, “wider sidewalks,” which has the highest means of “donation amount,” does not have a significant influence on “donation amount.” Some of the respondents might have seen the value of extra width to the walkways and, so, were willing to donate a high amount for wider sidewalk. The others (more than 30% of the respondents who responded to this solution) have not realized the value and did not donate for “wider sidewalks; or, they may see higher cost of having less car traffic surface. This development solution can be seen as containing different use values. Those who primarily walk valued the width of the sidewalk, as mentioned in the literature (Naderi & Raman, 2005), while the car owners valued the available parking spaces instead of the extra width of the sidewalk.

DISCUSSION

The results lead to further discussions on the differences in the patterns and the influencing factors of “preference” and “donation amount” for different physical development solutions. Furthermore, limitations, implications, and recommendations are described.

Differences in patterns and factors influencing preference and donation amount

Preference judgment and WTP are based on stated preference and are expected to share similar patterns. However, the results show that

they are different in this context. When comparing the results with the descriptive statistics, it is apparent that the rankings of “preference” means and the means of “donation amount” on the four different physical development solutions are different. Moreover, the sets of influential variables on “preference” and “donation amount” are also different. Therefore, the hypothesis that the patterns of preference and WTP for the development solutions, and the influential variables for preference and WTP would be similar cannot be accepted. Although “preference” and WTP are related, since “preference” is found to have significant positive influences on “donation amount,” these differences suggest that the makeups of preference and WTP are different.

When people evaluate the environment for preference, they depend much on their affective feeling toward the solution, thus focusing mainly on environmentally related factors. When considering the willingness to pay, people are more likely to be considering varied factors, concerns, and negotiations than when expressing their preference judgments. When they determine the “donation amount,” they depend on their concerns about their preference, use values, and affordability; thus, their personal characteristics become significant factors affecting the amount they will pay. Although the environmental variables have no significant influence on WTP, “preference” for the development solutions is necessary to gain WTP.

The results may suggest that: the influential personal characteristic factors for WTP seem to be related to use value and affordability rather than to those that influence preference such as familiarity or knowledge found in previous preference research. However, the influencing non use value for WTP in streetscape context of Chiang Mai’s old city are not sufficiently explained. Since the old city has become highly tourists’ oriented as well as a car-based district, there are possible explanations of different use values between business owners versus the residents and between the pedestrians versus the car owners, which need more evidences to verify.

Limitations

This research does have certain limitations. First, the experiment is rather simple in design with four one-level environmental variables, which cannot account for all the differences in the details of physical developments and their interactions. Second, the manipulation of environmental variables may not have been fully controlled for each specific effect. Changing one physical variable may affect other environmental variables. For example, adding trees may obscure other features of the scene. Expanding sidewalks also reduces driving lanes. Either of which could possibly influence preference.

Third, since the sample is not proportionally selected from the population, it includes a high percentage of lower income residents and a considerable number of students (35%), which may diminish the representativeness. These profiles of the sample may be resulted from the fact that they were recruited on the streets and public places rather than in private residents or shopping malls. Fourth, it is possible that the digitally created surrogate pictures using the photomontage technique have a lower degree of complexity or disorderliness than the real environment, regarding the electrical wires and the signs. This might lead to smaller differences in preference and WTP between the development solutions and the status quo, as well as within the development solutions.

Fifth, preference and WTP are measured sequentially; therefore, one response might have an effect on the other. Finally, there is no follow-up question on the reasons for paying in order to find out the indication of the use values the respondent sees in the solutions. Those reasons would clarify the relationships between use values and personal characteristics.

Implication and recommendations

This research shows that it would be possible to implement a streetscape development project with extra funds from the public to increase the budget for the physical development of the streetscape in Chiang Mai. The funds could be collected in

the form of donations from the residents, with the amounts most likely to be in the range of 100–200 Baht (3.3–6.6 USD). The total amount collected would depend on the scope of collection from the population. Furthermore, there is no indication that people who live further away would pay less than those living in the city.

To maximize the donation amount, the administrator should target higher income families, married people with more children, and those living outside the old city area, as well as increase preference for the development solution. Furthermore, to increase preference, the designer and planner should consider adding large trees in the design of the development solution and, then, increase the perception of better order and upkeep by removing the wires.

It is noteworthy that while the respondents generally preferred all the development solutions and decided to donate, one-fourth of them did not donate. This implies that only the preferred solutions, without the consideration of WTP, are not enough for development decisions. In addition, efforts by public relations departments toward promoting the benefits of public spaces that improve quality and standards of life along with examples of public responsibility as well as increasing public's confidence toward their local administration could help increase WTP.

If the budget collection plan is not applicable, at least, the WTP data could inform the administrator about the externality costs of the use values that the residents see for the development. They may use this information to prioritize the implementation of different developments. Otherwise, they can also use the WTP value to negotiate for the physical improvement of the streetscape as opposed to other kinds of spending. This could lead to better streetscapes and public spaces in the city.

For future research, a more complicated research design, such as conjoint design or choice modelling, which allows for a variety of factors with different levels and their combinations could provide a better understanding concerning the effects and interactions of these factors and levels. Furthermore, advanced analytical tools could be

used to identify the direct and indirect relationships between the influential variables, and preference and WTP. In addition, follow-up questions on the reasons for both paying and not paying could help identify different types of use values and clarify the underlying reasons for the influences of the different factors on the willingness to pay. For the design of instruments, better control and better representation for the manipulations of environmental variables could help increase external validity. Varying orders of preference and WTP measurements across the samples could help cancelling out possible order effect. Finally, sampling proportionally from the population as well as from different types of location could increase the representativeness of the sample and consequently the validity of the research.

CONCLUSION

This research has established an understanding of preference and WTP for the physical development of the streetscape in the old city of Chiang Mai, Thailand. It postulates that the factor affecting preference is the characteristics of the environment, which is similar across respondent groups. Environmental factors were found to have no significant influence on the WTP while “preference” and personal characteristic factors were seen to have significant influences on WTP. In addition, influential personal characteristic factors for WTP in the streetscape context of old city are related to family and economic statuses.

Designers and planners could concentrate on providing influential environmental factors for preference, while local administrators could manage WTP by communicating with people on the basis of their personal characteristics to implement development plans with the extra budget funding from the residents' donations. Alternately, the administrator can prioritize developments and negotiate spending based on the values that the residents expressed through WTP.

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