The Study of the Relationships among Psychological Factors, Acceptable Walking Distance, and Reported Walking Distance for Shopping Trips

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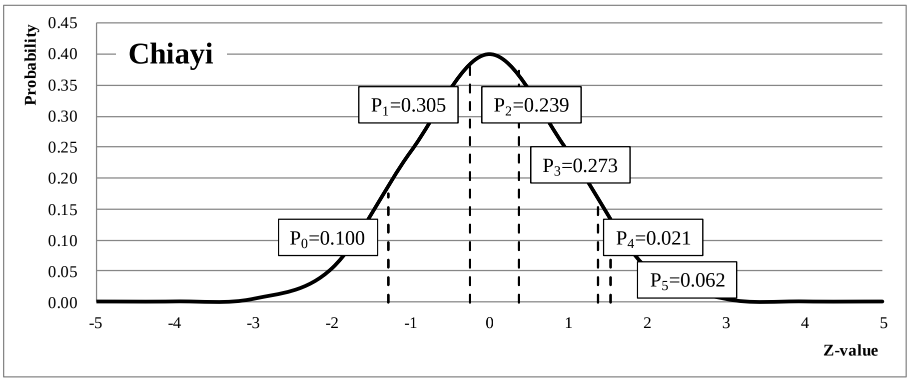
Abstract: The purpose of this study is to examine the relationship between psychological factors and walking behavior in order to provide evidence supporting the implementation of measures for behavioral change for the success of urban planning initiatives. The acceptable walking distance is selected as an intermediate variable between psychological factors and actual walking distance. The results indicate that increasing the acceptable walking distance has the potential to stimulate pedestrians to increase the amount of walking. Also, an ordered probit model has indicated that psychological factors have a significant influence on the acceptable walking distance. It is able to identify a sequence of cause and effect where psychological factors would first influence acceptable walking distance and then the acceptable walking distance would influence pedestrian walking distance. A policy of applying soft measures such as psychological strategies to increase the pedestrian output is supported by the findings of this project work.

Keywords: psychological factors, walking behavior, ordered probit model, walking distance

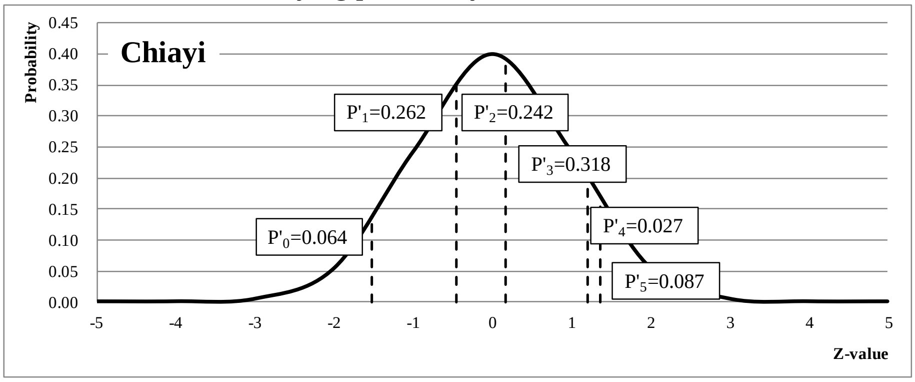
1. INTRODUCTION

Walking is not only a most basic means of transport for people in their daily life but also an indispensable means for completing the whole daily journey. Ideally, people can reach anywhere in the city by walking regardless of age and sex. It is recognized that walking has a specific advantage in terms of accessibility. Other than the accessibility, walking has further advantages as well, such as low cost, zero emission and environmental friendliness. In recent years, walking has played an important role in maintaining personal health as well. Saelens and Handy (2008) argued that walking is a common form of physical activity. Frank, Andresen, and Schmid (2004) also concluded that each additional kilometer walked per day was associated with a 4.8% reduction in the likelihood of obesity. There are more and more studies focusing on the health benefits of walking to date.

What do motivate people to walk? Or, what are the significant correlates with walking? These are essential issues to consider in urban planning. Mehta (2008) pointed out that walking is largely influenced by cultural factors, individual circumstances, preference and characteristics as well as environmental factors. Tsukaguchi, Vandebona, Yeh, Hsia, Jung, and



Underlying probability at variable means



Probability considering the partial effect of statement (a)

Figure 5 The partial effect of statement (a) in ***Chiayi*** model

5. CONCLUSIONS

This study attempts to examine the relationship between psychological factors and walking distance. Two proposed behavioral hypotheses have been explored using statistical methods. The result has shown that the person’s psychological factors are likely to influence his or her acceptable walking distance. In turn, the AWD is likely to influence his reported walking distance, RWD. It implies the possibility that the attitude change stimulates behavioral change. The partial effect of statement (a) is also examined based on the different cities. The results show that the value of difference is from 0.74 to 1.70 minutes as the level of statement (a) increases one unit. Assuming the average walking speed of general Taiwanese citizens is 75 meters per minute, the value of difference would be from 55.5 to 127.5 meters in terms of spatial distance.

For a long time, the thought of development based on hard measures has dominated the professionals engaged in planning practice. However, maintaining the existing infrastructure and enhancing the frequency of use through the soft measures has received many attentions in recent years. Soft measures as a distinct way of thinking from the reliance on hard measures for development has been proposed mainly because of cost considerations. This concept is based on the belief that an individual’s behavior can be changed through the interventions of soft measures or psychological strategies. The discussion about soft measures or psychological strategies is not the scope of this paper, it is however important to discuss the relationship between this paper's results and the extent to which it can influence policy or practice. The results of this study has demonstrated the causal sequence as psychological factors influence acceptable walking distance, and then, influence reported walking distance. Therefore, planners can employ soft measures to influence individual’s psychological factors first and expect the positive change of individual's behavior. It is recognized that needs for further research for the intervention of soft measures are required.

Comparison of models among four cities has indicated that statement (a) has a common impact on AWD. Policy implications of this finding would be a supportive concept for the intervention of soft measures. Furthermore, the comparison of models among four cities also has shown that each model has its own significant variables. Policy implications of this finding would be that the policy making have to consider different pedestrian psychological needs in different cities. Another conclusion that can be derived from these findings is the possibility of exploring a culture-oriented planning. However, the concepts related to practice of culture-oriented planning remain to be investigated in the future.

Some Limitations of this study and suggestions are addressed to point out the direction for future researches.

1) The value of acceptable walking distance may differ based on the particular trip purpose. The further study can extend the scope to examine the value of acceptable walking distance based on different trip purposes.
2) This study only examines the effect of psychological factors on acceptable walking distance. Apparently, many factors are not discussed in this study, such as built environment, social environment, and personal characteristics. All the overlooked factors can be taken into consideration in future studies.
3) The series of pedestrian travel culture projects had paid many attentions to conduct the international comparison of pedestrian attitude, preference, and personal reflection. However, the discussion of planning issue from the aspect of pedestrian travel culture is still lack. This study introduces psychological aspects of residents to supplement the body of work created about the concept of pedestrian travel culture. The future studies can apply the concept proposed by this study to Japanese, Korean, and Australian cities to establish the concept of pedestrian travel culture and to indicate the appropriate direction to pedestrian planning from the aspect of psychological factors.

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