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Article

Exploring walking choices in urban green streetscapes through the lens of the theory of planned behavior

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Abstract: This study employed the theory of planned behavior to examine how green urban spaces influence walking behaviors, with a focus on Chongqing's Jiefangbei Pedestrian Street. Using structural equation modelling to analyse survey data from 401 respondents, this study assessed the relationships between attitudes, subjective norms, perceived behavioral control, walking intentions, and actions. The results revealed that attitudes toward walking (β = 0.335, $p < 0.001$) and subjective norms (β = 0.221, $p < 0.001$) significantly predict walking intentions, which strongly determine actual walking behavior (β = 0.379, $p < 0.001$). Moreover, perceived behavioral control exerts a direct significant impact on walking actions (β = 0.332, $p < 0.001$), illustrating that both environmental and social factors are crucial in promoting pedestrian activity. These findings suggest that enhancing the appeal and accessibility of urban green spaces can significantly encourage walking, providing valuable insights for urban planning and public health policy. This study can guide city planners and health professionals in creating more walkable and health-conducive urban environments.

Keywords: urban green spaces; walking behavior; theory of planned behavior; structural equation modelling; urban planning

1. Introduction

Urbanisation is accelerating globally, challenging cities to adopt sustainable and health-promoting urban designs. This study investigated the impact of green streetscapes on pedestrian choices in Chongqing, China. Chongqing is known for its challenging terrain and crowded urban environment. This study used the theory of planned behavior (TPB) to analyse this influence. Central to this investigation is Jiefangbei Pedestrian Street, which has been transformed into a vibrant, green urban thoroughfare as part of Chongqing's strategic urban planning efforts (Liu et al., 2022).

The integration of green streetscapes is crucial for enhancing the aesthetic and safety features of urban environments, thereby improving walkability (Hsieh and Chuang, 2021). From an environmental psychology standpoint, integrating natural features into urban areas additionally improves the physical environment while also boosting people's psychological well-being, hence increasing their motivation to walk frequently (Baxter and Pelletier, 2019). Public health research further supports this, indicating that increased pedestrian activity can significantly reduce disease burdens and improve quality of life (Young, 2020).

Our study employed a quantitative approach to pinpoint the specific green streetscape features that most strongly influence walking behaviors. By integrating the TPB, we explore how attitudes, subjective norms, and perceived behavioral

control shape walking intentions and behaviors in the context of enhanced urban greenery. This methodological approach allows us to dissect the complex interplay between urban design elements and pedestrian behavior, offering novel insights into how well-designed green pathways can promote more active and sustainable urban lifestyles.

Consistent with previous findings on urban design and pedestrian behavior (Ernawati et al., 2018; Hsieh and Chuang, 2021), our research addresses a critical gap by quantitatively assessing how certain characteristics of green streetscapes can encourage walking in cities facing rapid expansion and challenging geographical conditions. This study aims to provide evidence-based recommendations for urban planners and policymakers, emphasising the importance of green streetscapes in fostering healthier urban environments.

2. Literature review

2.1. Underlying theory: The theory of planned behavior

In this study, the TPB is employed to unravel the psychological underpinnings influencing individuals' decisions to walk in urban environments, aiming to identify targeted interventions that can enhance urban walkability and promote healthier lifestyles.

This theory was developed by Icek Ajzen in 1991 and is a prominent psychological paradigm that elucidates the underlying mechanisms of human action in diverse areas, including physical exercise and environmental protection. The statement asserts that an individual's behaviour is primarily motivated by his or her intention to engage in that particular behaviour. However, this intention can be influenced by three primary factors, as shown in **Figure 1**: attitude towards the behaviour, which is one's positive or negative evaluation of it; subjective norms, which represent the perceived social pressure to perform or avoid the behaviour; and perceived behavioural control, which refers to one's ability to execute the behaviour (Ajzen, 1991). The combination of these elements contributes to an individual's motivational intent, which in turn influences their behaviour. Intention is emphasised as a crucial connection between individual thinking, societal influences, and the perception of control over one's actions. Moreover, the TPB asserts that perceived behavioural control has a direct influence on action, indicating that the level of ease or difficulty in carrying out a task can alter one's behaviours regardless of one's intentions.

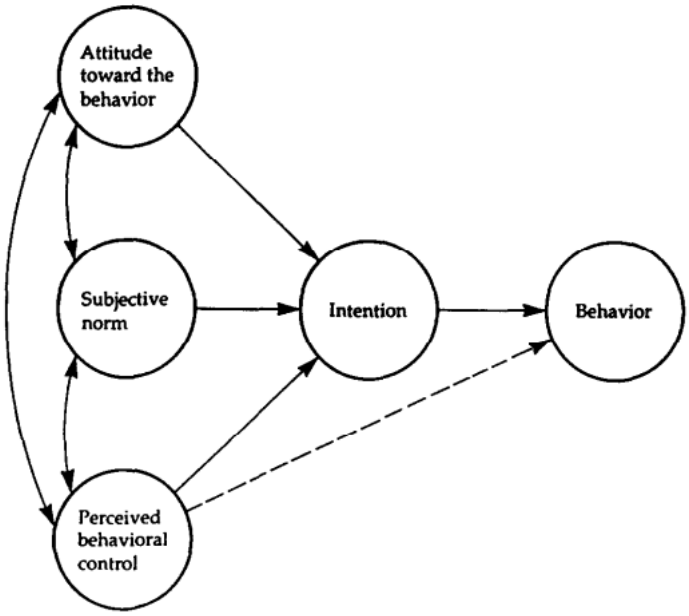

Figure 1. Theory of planned behavior model (Ajzen, 1991).

To enhance the explanatory and predictive capabilities of the TPB, Conner and Armitage (1998) conducted a study to validate other dimensions, such as moral norms, historical behaviour patterns, and affective beliefs. These enhancements have shown that the theory has a greater ability to understand the intricacies of human decision-making. They provide proof that factors beyond what was initially considered in the TPB's original formulation influence decisions such as walking in metropolitan surroundings.

Several empirical studies have emphasised the importance of the TPB in promoting pedestrian activity in urban environments (Meir et al., 2023; Meir et al., 2022; Sun et al., 2015). These studies have shown that attitudes towards walking, social influence norms, and autonomy in walking activities are important factors that push people to choose walking as their primary form of transportation. Another study suggested that fostering favourable attitudes towards walking, along with creating a supportive environment for pedestrians and enhancing perceived control, such as by improving safety measures, can have a substantial impact on residents' intentions and frequency of walking in towns (Yuriev et al., 2020).

Building on the foundational elements of the TPB, research has also explored the role of urban design in promoting pedestrian activity. According to Hsieh and Chuang (2021), urban design emphasises the importance of walkability, which involves creating urban landscapes that are more conducive to walking by enhancing aesthetics and safety through the use of green streetscapes. Environmental psychology provides a theoretical structure for comprehending how natural elements in urban environments can enhance an individual's well-being and motivation to engage in walking (Baxter and Pelletier, 2019); this suggests that strategic urban planning that incorporates green areas could promote a more active lifestyle. Additionally, public health advocates for walking as a means of active transportation, which has a substantial impact on reducing disease burdens and enhancing quality of life (Young, 2020). This highlights the strong connection between positive health

outcomes and the promotion of environmentally friendly communities. Within this study, the interplay of walkability, urban greenery's psychological benefits, and public health underscores the complex relationship between green streetscape design and pedestrian behaviors. Specifically, we examine how the enhancement of urban walkability through aesthetic and safety improvements, the psychological well-being fostered by natural elements, and the health benefits associated with active transportation converge to influence the active choice of walking in the context of Chongqing's urban environment. Hence, the TPB offers a comprehensive framework for examining the elements that affect pedestrian choices in urban environments. For this study, the TPB addresses the factors influencing people's intentions to walk.

2.2. Attitudes and walking

Walmsley (1995) argued that greenways have a long-standing and timeless appeal in urban design. These pathways not only connect fragmented urban spaces but also attract people by offering a more active and visually pleasing way to move around through aesthetics and recreational activities. Building upon this concept, Ng et al. (2012) conducted a study to explore the cooling impacts of urban greening. They observed that converting cities into greener environments benefits inhabitants in two ways: by improving visual appeal and providing thermal comfort. This dual-purpose situation has the potential to quickly and significantly impact urban residents, encouraging them to choose walking as their primary method of transportation.

In addition, Pérez-Urrestarazu et al. (2015) emphasised the importance of the dependability of vertical greening systems. They also highlight the benefits of these systems, such as enhancing air quality and promoting psychological well-being, which can subsequently influence the decisions made by pedestrians. Vogler et al.'s research on younger generations supports the idea that outdoor activities, such as walking, are greatly impacted by the design and accessibility of green spaces. Zhang et al. (2017) presented a conceptual framework that examines the impact of urban green spaces on public health, specifically focusing on the potential promotion of physical activity, such as walking. Moreover, Revich (2023) argued for the creation of more easily accessible green areas in cities to foster healthier lifestyles among residents.

After reviewing the literature, we propose Hypothesis 1 (H1), which states that positive attitudes toward walking in green urban spaces are associated with stronger behavioral intentions to walk. This hypothesis aims to quantify the impact of positive environmental perceptions on the willingness to choose walking as a regular activity.

2.3. Subjective norms and urban walking

Within the context of this study, subjective norms refer to the perceived social pressures or influences that affect individuals' decisions to walk within urban environments (Willis et al., 2015). These norms encompass the expectations, attitudes, and behaviors of peers, family (Korn et al., 2021), and the broader community toward walking as a mode of transportation or leisure activity, shaping how individuals perceive and partake in walking practices in cityscapes.

Some studies have properly examined urban pedestrian gait patterns. Middleton's (2018) analysis examined the various relationships and social norms involved in urban walking, shedding light on the influence of our walking behaviour on the discourse around the "right to the city". Similarly, Bairner (2011) demonstrated that walking serves as a means of acquiring knowledge, as it allows us to gain insights about politics and society.

Edensor's (2018) phenomenological method provides a fresh perspective on the act of walking. Walking is considered a physical activity that actively involves individuals in urban environments. Edensor mentioned the concept of 'place ballets', which refers to coordinated motions performed within urban areas. According to their perspective, these dancing movements emphasise the significance of subjective norms in influencing our manner of walking in urban environments.

In addition, Beenackers et al. (2014) examined the impact of psychological factors on the availability of leisure-time walking, shedding light on another dimension of the link between individuals and their surroundings. A study revealed that social influence has a profound impact on individuals' leisure activities, leading to the conclusion that community expectations play a substantial role in shaping pedestrian behaviour. In addition, Ariffin and Zahari (2013) examined more than simply physical locomotion while investigating urban pedestrian environments. The primary variables that contribute to excellent experiences on walks across cities are safety, design, and social interactions. Finally, Kärrholm et al. (2017) proposed the idea of material interaction to describe the process of traversing various walking assemblages in different regions inhabited by diverse individuals. According to their perspective, these encounters can provide insights into the factors that contribute to the superior transit capabilities of certain areas compared to others.

Given the robust evidence supporting the role of subjective norms in influencing walking behaviors, particularly within densely populated urban environments, we propose Hypothesis 2 (H2): higher perceived subjective norms related to walking in green spaces positively influence individuals' walking intentions. This hypothesis reflects the expected impact of social encouragement and community expectations on promoting walking activities.

2.4. Perceived behavioral control's impact on walking

According to Sun et al. (2015), PBC has an impact on walking behaviours, particularly in relation to health-related activities and interventions. According to Ajzen's theory of planned behaviour, PBC refers to an individual's perception of his or her own ability to carry out a specific behaviour. In regard to walking, this involves evaluating whether individuals can include it in their daily schedules and overcoming any obstacles such as time restrictions or physical restrictions.

Research conducted by Busse and Miranda (2018) has demonstrated the importance of PBC in encouraging consistent walking routines, particularly among individuals with medical conditions such as hypertension. The study revealed that persons who felt a greater sense of control over their walking routine were more inclined to modify their behaviour. This suggests that treatments that seek to enhance PBC could be successful in motivating people to walk more frequently. In a similar

vein, Darker et al. (2010) discovered that interventions aimed at enhancing PBC and implementing concrete plans for walking resulted in participants reporting increased intention and actual engagement in walking.

Ren and Kwon (2019) provided a distinct viewpoint by examining the influence of walking on perceived stress levels, emphasising the significance of PBC in encouraging individuals to walk as a means of reducing stress. The correlation between mental well-being and physical exercise highlights the possible advantages of integrating walking into one's daily schedule.

In light of these findings, we propose Hypothesis 3 (H3): greater perceived behavioral control is associated with stronger behavioral intentions to walk in urban green spaces. Furthermore, considering the direct influence of perceived control on behavior independent of intentions, we propose Hypothesis 5 (H5): greater perceived behavioral control is directly associated with increased actual walking behavior, independent of behavioral intentions. These hypotheses aim to explore both the mediating and direct effects of perceived behavioral control on walking behaviors.

2.5. Behavioral intentions and walking choices

According to the TPB, intentions play a crucial role in shaping behavioral decisions, as they are the primary means through which attitudes, subjective standards, and perceived behavioral control impact actual walking behaviors.

Sun et al. conducted a study in 2015 that examined how the components of the TPB influenced the walking behaviour of university students. The researchers discovered that students' walking behaviours are highly influenced by their behavioural intentions, which are determined by their perceived behavioural control, attitudes towards walking, and subjective standards. Therefore, implementing targeted interventions to promote walking on university campuses could have a substantial impact on the overall health of young adults by promoting active transportation.

Rhodes and Lim (2016) examined the walking habits of individuals who own dogs. Several dog owners expressed excellent intentions but ultimately did not fulfil them as promised during the interviews. To comprehend the reasons behind individuals failing to accomplish their targeted actions while others succeed, researchers have employed the multiprocess action control framework model to differentiate between successful and failed individuals. Their research indicated that affective judgments, automaticity, and planning significantly influence an individual's decision to walk, regardless of their initial intention. They believe that by utilising these elements, interventions can be implemented to enhance the overall level of physical activity among individuals who own dogs.

In their study, Galea and Bray (2006) examined individuals suffering from intermittent claudication, a condition characterised by reduced blood flow and resulting pain. They discovered that some elements of the TPB were able to significantly predict whether these individuals would walk or not, explaining a substantial percentage of the observed variance. Attitude was the primary determinant, followed by the combined influence of subjective norms. Perceived behavioural control had a lesser impact when considering both attitudes and

subjective norms.

Reflecting this significant role of intentions in translating psychological predispositions into physical actions, we propose Hypothesis 4 (H4): stronger behavioral intentions are positively associated with increased actual walking behavior in urban green spaces. This hypothesis seeks to quantify the direct relationship between the intent to walk and subsequent engagement in walking activities within urban settings.

To elucidate the relationships among these variables, a research model inspired by the TPB was constructed, as shown in **Figure 2**. This model aims to visually represent how attitudes, subjective norms, and perceived behavioral control collectively influence behavioral intentions, which in turn predict actual walking behavior. Additionally, it highlights the direct influence of perceived behavioral control on walking behavior, showcasing its dual role in shaping both intentions and actions.

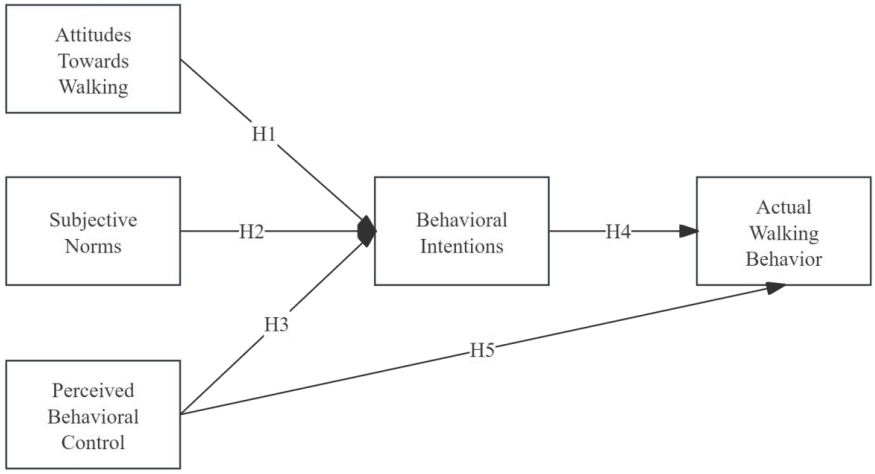

Figure 2. Research model.

3. Methodology

3.1. Research design

This study employed a spatially confined random sampling method (Gürsoy et al., 2014) to examine the factors that impact pedestrian behaviours in the vicinity of Jiefangbei Pedestrian Street (29.55 N, 106.57 E), a renowned urban green area in Chongqing. This method employs a random distribution of questionnaires to individuals walking in four particular locations, shown by the Arabic numbers in **Figure 3**, around the central emancipation monument. This ensures that each person has a fair chance of being chosen. This design is highly advantageous for analysing individuals' walking preferences in this affluent urban region and can offer valuable insights into various pedestrian populations.

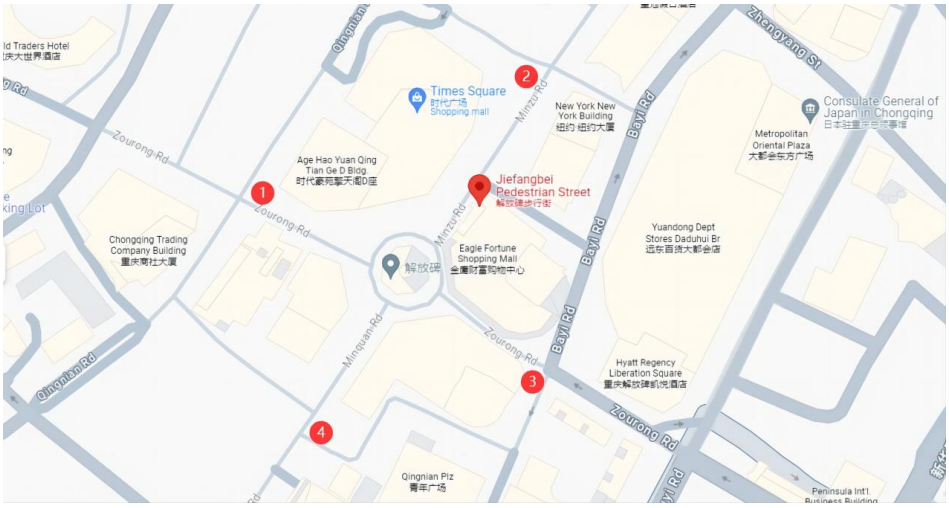

Figure 3. Questionnaire distribution and collection sites.

Moreover, this study provides a snapshot of attitudes, subjective norms, perceived behavioural control, behavioural goals, and actual walking behaviour at a single moment in time. This snapshot-like characteristic facilitates the identification of patterns between variables derived from the TPB. Additionally, it offers a quantitative evaluation of the influence of these psychological elements on walking behaviours in an urban environment.

The utilisation of spatially confined random sampling is crucial for this research because it effectively combines the elements of randomness and practicality, particularly when prioritising environmental significance. By implementing this methodology in urban environments, we can gather pertinent data that improve the reliability and validity of our findings while also increasing their generalizability in comparison to similar locations. By randomly sampling within predefined places around Jiefangbei Pedestrian Street, we can ensure that our sample includes individuals from diverse backgrounds. This approach helps us prevent selection bias and eventually strengthens the reliability of our results.

3.2. Population and sample

The population of interest comprises a wide demographic group, including local residents, office workers, shoppers, and tourists, who interact with this space in various capacities, such as commuting, leisure, and shopping. Given the study's objective to apply the theory of planned behavior in understanding these walking behaviors, a sample size of 350 participants was determined. This decision is informed by a comprehensive review of related literature and best practices in quantitative research, particularly studies employing structural equation modelling and those exploring pedestrian behaviors within urban settings.

The choice of 350 participants is grounded in the recommendations of Hair et al. (2010) regarding sample sizes for structural equation modelling, which advocate for a minimum of 5 to 10 respondents per estimated parameter to ensure adequate statistical power. Considering the complexity of the TPB, which includes multiple constructs and potential direct and indirect effects, this study aims to capture the nuanced dynamics of walking behavior.

Additionally, empirical benchmarks from studies such as Rhodes and Courneya (2003) have been considered. Their research on physical activity within TPB frameworks suggests that samples ranging from 200 to 400 participants allow for the detection of significant relationships and predictors. Similarly, insights from urban studies emphasise the need for substantial sample sizes (at least 300 participants) to achieve reliable analyses and factor loadings in investigations of pedestrian behavior in urban contexts.

3.3. Questionnaire design

The questionnaire for this study was meticulously constructed to evaluate the psychological factors influencing individuals' walking behaviour within urban environments, specifically through green urban pathways in Chongqing. This assessment is structured around the TPB, with variables including Attitudes Towards Walking, Subjective Norms, Perceived Behavioral Control, Behavioral Intentions, and Actual Walking Behavior. The questionnaire employs a 5-point Likert scale ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree") to measure participant responses to the following items, as shown in **Table 1**.

Table 1. Questionnaire items.

Variables	Items	References
Attitudes Towards Walking	I find walking along green urban pathways enjoyable.	Sun et al. (2015)
	Walking in green urban areas contributes positively to my health.	
	I feel relaxed when I walk in natural urban environments.	
Subjective Norms	My friends and family support the idea of me walking more in urban areas.	French et al. (2010)
	People important to me value walking in green areas over driving.	
	In my social circle, walking in green urban spaces is a preferred activity.	
Perceived Behavioral Control	I am confident that I can make walking in green urban pathways a regular part of my life.	Darker and French (2009)
	I feel I have the ability to walk in green urban areas regularly despite challenges.	
	Even when my schedule is busy, I believe I can find time to walk in green urban spaces.	
Behavioral Intentions	I intend to use green urban pathways for walking in the next week.	Sun et al. (2015)
	I am determined to incorporate walking through green urban areas into my daily routine.	
	Choosing to walk, especially through green urban areas, as a mode of transportation is a goal for me in the near future.	
Actual Walking Behavior	I choose walking along green urban pathways for most of my local trips.	Ajzen (1991), Rhodes et al. (2006)
	Walking in green urban areas is my preferred method for short-distance travel.	
	I consistently use green urban pathways for leisure walking or exercise.	

3.4. Data distribution and collection instrument

An electronic survey is the primary instrument used for data collection in this research. Through the utilisation of this electronic format, data may be acquired from a wide array of people, which is essential for comprehending the varied walking patterns and reasons inside this urban area.

The study's online survey was hosted on Wenjuanxing (wjx.cn), as it was deemed the best platform choice. Wenjuanxing is renowned for its extensive range of features that efficiently simplify data collection procedures. It provides an optimal combination of user-friendliness and technical properties. The interface is designed to be user-friendly, ensuring high levels of engagement and response rates, which is crucial for achieving our study objectives. In addition, Wenjuanxing adheres to rigorous privacy measures when collecting and managing data. The software guarantees the anonymity and security of all participants, in accordance with the ethical norms essential to this research.

To obtain a broad spectrum of participants from the Jiefangbei area, the questionnaire can be disseminated via QR codes. This strategy aims to engage a significant number of people to obtain a diverse range of perspectives from individuals who walk the streets.

3.5. Data analysis

During the examination of the data for this study on walking behaviour on Jiefangbei Pedestrian Street, the initial step involved performing a demographic analysis. This provided us with a deeper understanding of the individuals who participated in the experiment and established a solid basis for our work. The reliability and validity of the questionnaire used to assess constructs from the theory of planned behaviour were established by calculating Cronbach's alpha and performing confirmatory factor analysis. Both demonstrated the reliability and precision of the metrics employed. To examine the interrelationships between attitudes, subjective norms, perceived behavioural control, intentions, and actual walking behaviour, we employed structural equation modelling (SEM). This approach provides a thorough and extensive method for examining the connections between various variables. The data analysis software chosen was SPSSPRO (version 1.0.11), a well-known online analysis platform (https://www.spsspro.com) that includes demographic information summaries, SPSS base analysis, and SEM analysis.

4. Results

4.1. Demographic

As shown in **Table 2**, the data provided highlight the demographic characteristics of survey participants and reveal significant patterns relevant to the analysis of walking behaviors. The age distribution indicates a strong presence of younger individuals, with the largest group being the 26–29 age cohort (88 individuals), which is evenly split between genders. This is closely followed by those aged 19 or younger, with males (49) outnumbering females (31), suggesting a robust

engagement among younger males in pedestrian activities at Jiefangbei Pedestrian Street.

Additionally, a slight female predominance is observed in the 20–22 and 23–25 age groups, reflecting active participation in pedestrian activities, likely due to the area's appeal to young adults. Overall, the survey shows a marginal female majority, with 205 females to 196 males, indicating that walking as a mode of transit and leisure in urban green spaces is fairly balanced between genders, with a slight female tilt.

Table 2. Demographic summary.

Category	Options	Gender		Total
		Female	Male	
Age	19 or younger	31 (38.8%)	49 (61.3%)	80
	20–22	39 (47.6%)	43 (52.4%)	82
	23–25	55 (64.7%)	30 (35.3%)	85
	26–29	44 (50.0%)	44 (50.0%)	88
	30 or older	36 (54.5%)	30 (45.5%)	66

4.2. Reliability and validity

Table 3 demonstrates strong internal consistency, as indicated by a Cronbach's alpha coefficient of 0.904 and a standardised alpha of 0.903 over 15 items. This finding is based on a sample size of 401. The high reliability of the survey items demonstrates that they effectively measure the various components of the theory of planned behaviour, including attitudes towards walking (ATW), subjective norms (SN), perceived behavioural control (PBC), behavioural intentions (BI), and actual walking behaviour (AWB). This reliability ensures that the data collected can be analysed with confidence in the context of urban walking in this study.

Table 3. Reliability.

Cronbach's α coefficient	Standardised Cronbach's α coefficient	Items	Samples
0.904	0.903	15	401

As shown in **Table 4**, the Kaiser–Meyer–Olkin (KMO) measure obtained a value of 0.865, indicating that the data in this study are highly suitable for factor analysis. Additionally, Bartlett's test of sphericity resulted in a significant chi-square statistic of 3469.118 (df = 105, $p < 0.001$***), providing strong evidence to reject the null hypothesis that the correlation matrix is an identity matrix. The results indicate that the dataset is suitable for uncovering hidden patterns through factor analysis.

Table 4. KMO test and Bartlett's test.

KMO Value		0.865
Bartlett Sphericity Test	approximate chi-square	3469.118
	df	105
	P	0.000***

Note: *** represents 1% level of significance.

4.3. SEM analysis

The standardised path coefficients (β), as shown in **Table 5**, which facilitate interpretation by providing values on the same scale, indicate that ATW, SN and PBC have significant positive effects on BI, with values of 0.335, 0.221, and 0.213, respectively. This suggests that more favourable attitudes, greater perceived social support, and greater levels of perceived control are associated with stronger intentions to engage in walking behaviors in urban green spaces.

Moreover, BI has a strong positive effect on AWB, with a standardised coefficient of 0.379, indicating that the intention to walk is a significant predictor of walking behaviour itself. Additionally, PBC has a direct positive effect on AWB, with a standardised coefficient of 0.332, suggesting that perceived ease or ability to walk also contributes directly to walking behavior, in addition to its indirect effect through intentions.

In addition, the nonstandardised coefficients provide the actual magnitude of the effects, while the *Z* values and associated *P* values confirm the statistical significance of these paths, with all listed coefficients showing high significance levels ($p < 0.001$***).

Table 5. Model regression coefficients.

X	→	Y	Nonstandardised coefficients	Standardised coefficients (β)	Standard errors	*Z*	*P*
ATW	→	BI	0.325	0.335	0.06	5.37	0.000***
SN	→	BI	0.213	0.221	0.056	3.794	0.000***
PBC	→	BI	0.197	0.213	0.057	3.442	0.001***
BI	→	AWB	0.379	0.379	0.059	6.389	0.000***
PBC	→	AWB	0.307	0.332	0.053	5.766	0.000***

Note: *** represents 1% level of significance.

The analysis results corroborate the TPB's propositions, demonstrating the interplay between attitudes, subjective norms, and perceived control with behavioral intentions and actual walking behaviors. The significant path coefficients also provide empirical support for the development of targeted interventions that could leverage these factors to promote walking in urban environments. **Figure 4** shows the detailed relationships between the factors.

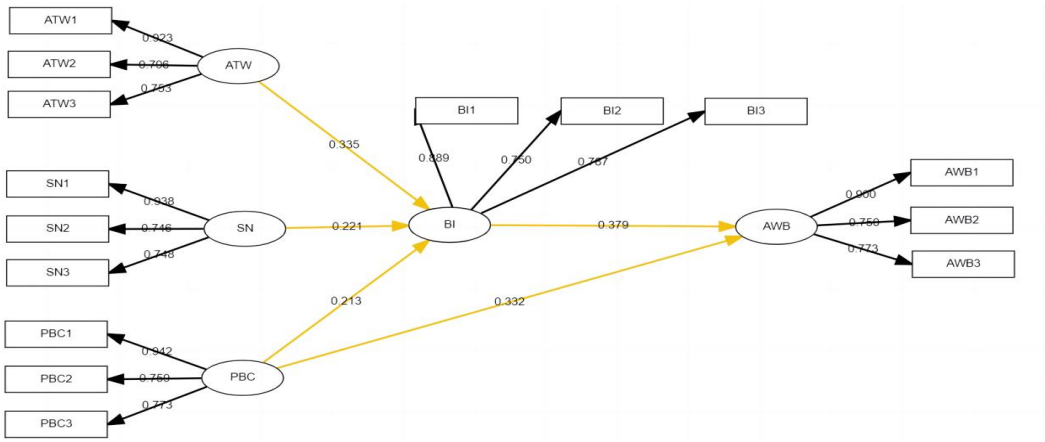

Figure 4. SEM path diagrams.

5. Discussion

This study leverages the TPB to investigate the determinants of walking behaviors among visitors to Jiefangbei Pedestrian Street, focusing on the roles of attitudes, subjective norms, and perceived behavioral control. Our findings reinforce the theory's applicability in urban green spaces, indicating robust connections between these psychological factors and both the intentions and actual behaviors of walking.

Our results demonstrate that positive attitudes towards walking in green urban spaces significantly boost intentions to walk, echoing findings by Ng et al. (2012), who noted the crucial role of aesthetic and environmental features in promoting walking. This study extends their observations by quantitatively linking these attitudes to increased walking behavior, suggesting that enhancing the visual and recreational appeal of urban landscapes could be a potent strategy for encouraging walking. The consistency of these findings with the literature underscores the need for urban planners to focus on aesthetic improvements that can make walking more appealing.

The impact of subjective norms on walking behaviors observed in our study aligns with the findings of Bairner (2011), who discussed the social learning aspects of walking. Our analysis further illustrates that social encouragement significantly influences individuals' decisions to walk, supporting interventions aimed at shaping public perceptions of making walking a socially endorsed activity. This finding corroborates the approach of Willis et al. (2015), who emphasise the role of community norms in fostering sustainable transportation habits.

Confirming hypotheses from studies such as Darker et al. (2010), our research revealed that perceived behavioral control directly influences both the intentions and the actual behaviors of walking. This suggests that addressing physical and infrastructural barriers to walking, as highlighted by Ren and Kwon (2019), can directly enhance pedestrian activity. These findings argue for a dual approach in urban design that combines improving physical accessibility with promoting the perception of accessibility to encourage walking.

Theoretical and Practical Implications: This study not only supports the TPB in a new context but also enhances our understanding of the intricate dynamics between environmental design and walking behavior. By providing empirical evidence on how specific TPB components affect walking, this research offers actionable insights for urban planning and public health initiatives aimed at increasing physical activity through environmental adjustments. Moreover, these findings suggest that public health campaigns should not only promote the benefits of walking but also address social and environmental factors that can inhibit or encourage this behavior.

In terms of future directions, motivated by the results, future investigations could examine the effects of additional environmental and psychological variables that were not addressed in this study, such as the influence of digital mapping and online social networks on walking behaviors. Furthermore, longitudinal studies could evaluate the effects of modifications in urban green space design on walking behaviors over an extended period, thereby enhancing our comprehension of cause-and-effect linkages.

Overall, this study highlights the significant role that urban design and community norms play in shaping walking behaviors. It provides a comprehensive framework for cities aiming to enhance their livability and sustainability by fostering more walkable environments. As urban populations continue to grow, integrating these insights into city planning and public health strategies becomes essential for promoting healthier, more active communities.

6. Conclusion

This study applied the theory of planned behavior to examine walking behaviors within the context of Jiefangbei Pedestrian Street, focusing on attitudes toward walking, subjective norms, and perceived behavioral control. Our findings indicate that each of these factors significantly predicts the intention to walk, which in turn influences actual walking behaviors.

Our findings indicate a significant correlation between favourable attitudes toward walking in urban green spaces (Hypothesis 1) and a greater likelihood of intending to walk. This underscores the importance of aesthetic and recreational features in urban planning, which enhance the attractiveness and enjoyment of walking, leading to more frequent walking behavior.

The study also confirmed Hypothesis 2, demonstrating that positive subjective standards have a substantial impact on increasing walking intentions. This highlights the role of social influences and community expectations in promoting walking, suggesting that public health campaigns and community planning should focus on creating a supportive social environment for walking.

Both Hypothesis 3 and Hypothesis 5 were confirmed, indicating that individuals who perceive greater ease and accessibility in walking are more likely to have strong intentions to walk and are also more likely to engage in walking behaviors independently of their intentions. This finding emphasises the need for urban infrastructure that supports easy and safe walking pathways.

Finally, Hypothesis 4 was validated, showing that stronger intentions to walk are indeed linked with greater actual walking behavior. This connection validates the need for interventions that not only improve the physical environment but also aim to enhance individuals' psychological readiness to walk.

These findings demonstrate that enhancing urban green spaces can effectively promote walking behaviors by improving both physical accessibility and perceived social support for walking within these environments. The evidence from this study provides robust support for the development of urban planning policies that prioritise pedestrian-friendly amenities and environments. These policies should be aimed at enhancing both the physical layout of walking paths and the social context in which they are situated.

In conclusion, the responses to our hypotheses offer a clear roadmap for urban planners and public health officials to create more engaging and supportive environments for walking. By understanding and addressing the factors that influence walking behavior, cities can promote healthier lifestyles and enhance the quality of life for their residents.

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