

BUILT ENVIRONMENT ROLE IN CHANGING MOTHERS PERCEPTION ON CHILDREN'S WALKING INDEPENDENTLY TO SCHOOL

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Abstract. Women have a great significance in their children's lives from the moment they are born. The choice that mothers make regarding their children's mode of travelling to school will have a significant impact on how those children will think about walking and cycling in the future. The purpose of this study is to identify the perspectives of mothers towards allowing their children to school by walking in an area that is deemed suitable for such trip in our discussion on the nation's future generation towards walking and not depending on private vehicles as the main mode of travelling. A focus group discussion, also known as FGD, took place in Taman Ilmu, which is in Nibong Tebal, Pulau Pinang. As a result of this study, using thematic analysis to analyse the results of conversation during the FGD session and collective mapping, we discovered four (4) themes of mother's perspectives towards their children walking to school, which are as follows: (1) confidence and trust; (2) safety; (3) age and gender; and (4) weather. In summary, the built environment can be described as a solution to the 'out of control' scenario in which government and parental roles are effective in resolving the issue of children walking independently to school.

Keywords: Mobility; Children Safety; Urban Planning; Safe City

[Judul: Peran Lingkungan Terbangun Dalam Perubahan Persepsi Ibu Terhadap Kemandirian Berjalan Kaki Anak-anak ke Sekolah] Wanita berperan penting dalam kehidupan anak-anak mereka sejak lahir. Pilihan ibu terhadap moda perjalanan anak ke sekolah akan berdampak signifikan pada bagaimana anak-anak akan berpikir tentang berjalan dan bersepeda di masa depan. Penelitian ini bertujuan mengidentifikasi cara pandang para ibu mengizinkan anaknya berjalan kaki ke Sekolah sebagai generasi penerus bangsa yang tidak bergantung pada kendaraan pribadi sebagai moda utama untuk bepergian. Focus group discussion (FGD) dilakukan di di Taman Ilmu, yaitu di Nibong Tebal, Pulau Pinang. Dengan menggunakan analisis tematik, penelitian ini menganalisis hasil percakapan selama sesi FGD dan pemetaan kolektif. Kami menemukan empat (4) sudut pandang ibu terhadap anak-anaknya yang berjalan kaki ke sekolah, yaitu: (1) kepercayaan diri dan kepercayaan; (2) keamanan; (3) usia dan jenis kelamin; dan (4) cuaca. Dapat disimpulkan bahwa lingkungan terbangun dapat digambarkan sebagai solusi skenario 'di luar kendali' di mana peran pemerintah dan orang tua cukup efektif dalam menyelesaikan permasalahan kemandirian berjalan kaki anak ke sekolah.

Kata Kunci: Mobilitas; Keselamatan Anak; Perencanaan Kota; Kota yang Aman

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1. INTRODUCTION

Different surveys on children walking to school have been released in recent decades because of

the rising obesity-related issues among children found low levels of physical activity can predispose children to obesity and later life chronic disease (Anderson & Butcher, 2006; Ford, Bailey, Coleman,

Woolf-May, & Swaine, 2007; Goran, Reynolds, & Lindquist, 1999; Wen et al., 2007). Several other studies on mothers agree that mothers have more control and power over their children's school trips than fathers (DiGuseppi, Roberts, Li, & Allen, 1998; Noreen C. McDonald, 2008; Noreen C McDonald & Aalborg, 2009; Vovsha & Petersen, 2005). While middle-aged mothers with children are the most likely to drive to and from work and childcare (Maciejewska & Guasch, 2019). Nevertheless, there is a lack of study that coincides with the needs of parents in particular for mothers commuting to work with the needs of taking children's to school. Thus, there is a void in the field of research focusing on mothers concerned about their children walking to school in Malaysia. The mother's views on safety, health or school distances were also sought in this research to allow their children to go to school independently.

As the mothers themselves have tendency to use cars, this influences their children's perception towards the mode of transportation. Susilo and Liu (2016) investigated the children's travel mode share and results showed that the influence of mothers' car use towards the children's travel mode share is more visible than father. In addition, a study conducted by He and Giuliano (2018) shows the results that the percentage of mothers who chauffeured children using cars was higher than fathers. This article is focusing on mothers as they are responsible for their children to school than father (Mauch & Taylor, 1997; Motte-Baumvol, Bonin, & Belton-Chevallier, 2017; Rosenbloom, 1987; Sener, Lee, & Sidharthan, 2019).

Noreen C. McDonald (2008) found in a well-known study that 5–14-year-old preschoolers whose mothers work in the morning are less likely to walk or cycle to school than those who do not live along the route. Noreen C. McDonald (2008) in other prominent study on 'Walking School Bus' found about 75% of parents taking their kids less than 2 miles to school cited convenience as an excuse (Noreen C McDonald & Aalborg, 2009). The work status of mothers is also associated with the walking and commuting to school, but not the work status of fathers. This study showed that children with fulltime working mothers and commute to work in the morning are less likely to walk or use the bicycle to school. Mother's fears

about road hazards and the danger of kidnapping or abuse may be correlated with this issue, possibly related to the decline in independence travelling. While Yarlagadda and Srinivasan (2008) finds the distance between home and school is observed to have a positive and detrimental effect on the option of walking to and from school, with the impact of walking to school being greater. Several factors of land-use and built-environment were analysed, but were found not to be statistically important predictors. Therefore, this study will also use collective mapping as a method to understand built environments factors such as the road, the street lighting, the building designs in determining mother's decision on their children mode of travelling to school other than considering mother's perception as consideration of this debate.

Despite the circumstances, as motorization grows rapidly in many places across the nation, parents often increase their concern about the safety and well-being of children, particularly mothers. In Malaysia, road traffic fatality among children aged 0-18 years old resulted in about 13.6% in 2007 to 15.5% in 2009. Among the children, 12% were pedestrians suffering from fatal road traffic. In addition, the highest age group that road accidents involving pedestrians take place at school were 10-14 years old (18.5%) followed by the age group 5-9 years old (16.5%) (Mohamed, Wong, Hashim, & Othman, 2011). Cases reported in the mass media have been alarming in Malaysia with many school children being hit while walking to school or when crossing roads to go to the school every year. Abduction and sexual harassment are another major concern and it appears like the children's environment is no longer completely safe for them. As a result, many of the parents of the recent generation have been more vigilant than ever. Changes in the practice of parents taking children to school by themselves are steadily emerging over the last 10 years in Malaysia in the light of potential risk. Therefore, private vehicles

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are the main choice of transportation mode to and from school. As a result, congested roads in school areas are seen as a typical scenario. It is because parents driving children will cause traffic congestion in front of the school at peak hours to pick up and drop off their children. Parents were seen as decision-makers for their children, whether or not their children could walk to school unaccompanied (Duncan et al., 2016). And yet children were less likely to be allowed to attend school without supervision because the parents were worried about their safety. Parents, therefore, decide to increase supervision of their children by driving them everywhere (Drianda & Kinoshita, 2011). However, the study observed that children driven by private cars were the first and second leading cause of accidents deaths among children aged 1-4 (43.8%) and 5-9 years (30.2%) in Malaysia, respectively (Mohamed et al., 2011). Children are vulnerable on the road, either by active transport or passive transport, and that is why parents are always concerned about the safety of their children on the road. According to the findings of a study that was carried out by Colder, Mott, Levy, and Flay (2000), high levels of aggression were connected to strong favourable perceptions of violence, which in turn were connected to the feeling that the community posed a threat. It was hypothesised that elevated expectations of the threats posed by the neighbourhood would influence parental practises. It was hypothesised that exposure to a hazardous environment would result in psychological distress, which might impede an individual's ability to be an effective parent. Alternatively, it might prompt parents to exercise extreme levels of control over their children in an effort to shield them from harm, which would paradoxically result in increased instances of aggressive behaviour.

Thus, suggesting such perceived danger conditions can influence children's minds. Others have argued that the child's psychological well-being is significantly influenced by the child's family and community (Bronfenbrenner, 1986). A comparative study by Shaw et al. (2013) about children's independent mobility between England and German from 1971-2010 summarizes three factors that affect children's independent mobility which is individual factors (e.g. age, gender, etc.), psycho-social factors (e.g. perceptions of safety) and

physical environment factors (e.g. land use and transport system characteristics). However, in the recent decades researchers found parent's perception of children walking to school is strongly related to traffic hazards. Safety of children on the road has been the main factor of concern among parents when talking about children going to school in past studies (Mackett, 2002; Olvera et al., 2012; Rothman et al., 2015). This research aims to develop a more in-depth understanding by :

- i. Identify mothers' perceptions about allowing their children walk to school independently through Focus Group Discussion.
- ii. Identify built environment factors such as the road, the street lighting, the building designs as an influence to mother's perception on safety using the collective mapping methodology.

The methodology of this study was decided based on previous research made on the topic involving mother's, parents and children. A reference was made on Ahern et al. (2017) study on 20 parents with children aged 4-12 years old to understand the parents' school travel choice. The thematic analysis of his study shows that the theme environmental and policy consists of distance, time constraint and multiple trips, traffic, supporting infrastructure, and weather and resources influence the parents' decision. While Ahlport, Linnan, Vaughn, Evenson, and Ward (2008) conduct focus group discussion with parents to study both barriers and facilitators of active transportation to school. There are few thematic areas of the barriers which namely fear of child abduction, sibling issues, weather, parental peace of mind. A reference were also made on Nikitas, Wang, and Knamiller (2019) on the study about parent's perception towards WBS using focus group discussion and thematic analysis. Result shows that there are six thematic areas; logistics, safety, trust, health and wellbeing, emotional needs and educational opportunities. Based on this study and other similar experiments, the FGD questions were then constructed.

2. METHODS

This research uses qualitative method by using the Focus Group Discussion (FGD) to collect mother's perception about children walking to school as well as using the Collective Mapping as tool to get

mother's perception on the built environment from their home to school. The discussion and collective mapping was conducted in a two session in February, 2021. Collective mapping is extensively used to promote community participation and inclusive participation, as well as in disaster preventive research. The selected study area is Taman Ilmu, Nibong Tebal, Pulau Pinang with a neighborhood area of 0.20 km² and surrounded by various facilities including educational facilities (primary school and secondary school) that are situated within the range of walking distance. The primary school is situated within a range of 500 meters from the residential area (as shown in Figure 1) with a total of approximately 700 students aged 7–12 years old. Based on the observation, the school is located next to the secondary school. Thus, various facilities are provided in order to cater the student needs such as bicycle parking spaces, bus waiting area, covered pedestrian walkway and pedestrian cross bridge. However, it was found that from the interview with the school headmistress, considering the walking distances, 80 percent of school children in the area went to school by car or motorcycle. During the rush hour, this has caused a great deal of traffic in school areas.

The participants were selected voluntarily during the public invitation for involvement across the community forum via WhatsApp Group. The conditions for inclusion are (1) a mother whose children attended the primary school and (2) a resident of Taman Ilmu. A total of nine (9) participants have participated voluntarily in the FGD and the participation numbers are limited due to the pandemic Covid-19 crisis recently. Nonetheless, to ensure the validity of the data, all participants were chosen from different backgrounds of household income and professions.

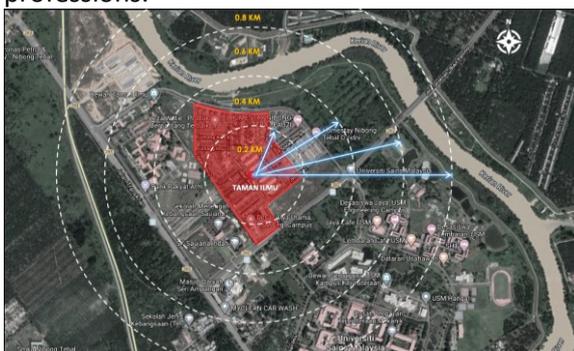


Figure 1. Map of Taman Ilmu, Nibong Tebal

The participants were divided into three (3) groups and each group was conducted by few facilitators including the principal investigator and an assistant to record all of the information in the forms of audio recording and note-taking during the discussion process (Refer Table 1). The moderator guideline was prepared beforehand to maintain the degree of continuity (questions and answers) between different groups. The FGD was done in Malay language as a local language and it was entirely transcribed into English version for study purposes. The participants were also being informed regarding the study ethics and the acknowledgment in participating, engaging, and expressing their opinions in the group discussion. A token of appreciation in the form of vouchers was given to the participants after completing the mapping and also the discussions. Before that, the participant's consent (profile details and audio recorded) were obtained and all of the details were anonymous for research purposes only.

Table 1. Focus Group Discussion (FGD) Participants Key Characteristics

Focus Group Discussion 1				
N	Code	Child's Gender	Travel to school	Age of Children
1	Participant 1	L	With mother	7
		L	With mother	7
2	Participant 2	L	With mother	9
		P	With mother	7
3	Participant 3	L	With mother	8
		L	With mother	7
		P	With mother	4
Focus Group Discussion 2				
4	Participant 4	L	Bicycle	12
		L	With mother	9
		L	With mother	6
		P	-	2
5	Participant 5	F	With mother	8
6	Participant 6	L	Bicycle	10
		L	With	8

Focus Group Discussion 1				
N	Code	Child's Gender	Travel to school	Age of Children
			mother	
		L	With mother	6
Focus Group Discussion 3				
7	Participant 7	L	With mother	10
		P	With mother	3
8	Participant 8	L	With mother	8
		L	-	1
9	Participant 9	P	Motorcycle	11
		P	Motorcycle	9

3. RESULT AND DISCUSSION

The core findings of this study are divided into two (2) sections where the details are as follows : For the first section, the findings were focusing on the mother's perception regarding the children's walking to school. By using thematic analysis, four (4) themes were identified as the influencing factors on the mother's decision making on children's independent travel to school. The factors are (1) confidence and trust, (2) safety, (3) age and gender and (4) weather. In addition, each of the mothers were asked to draw their children route to school and describe about issues and problems regarding their neighbourhood area on a map.

3.1 Mother's Decision-Making Factors

3.1.1 Confidence and Trust

The initial findings pertain to the mothers' confidence and trust, which refers to the mothers' confidence in their children's abilities to be independent and the potential dangers in their environment. It is regarded as the primary factor influencing the decision-making process, particularly among mothers, regarding children walking to school. Nevertheless, under certain conditions, such as travelling with friends, parental trust in permitting children to get to school by foot increases. In addition, some mothers rely on their

children's maturity in terms of self-awareness regarding potential risk and safety. With this information, parental confidence in children's independent travel increases.

Respondents also mentioned that their decision to allow their children to travel to school independently is influenced by their children's level of self-assurance, despite the possible threats to the children's safety on the road. Aside from that, respondents' confidence and trust are contingent on adult supervision, particularly when youngsters are playing outdoors. According to the FGD, the majority of mothers felt that children's confidence increases when accompanied and supervised by adults or parents. Even when going with friends, one participant distrusts their children owing to their behavioural features and lack of understanding regarding self-awareness and potential dangers. The mothers degree of confidence and trust in their children and the surrounding environment (strangers, physical environment) do influence parental decisions regarding whether or not to permit children to walk to school. It is essential to recognise the parents, particularly mothers, regarding their children's competence and self-awareness regarding potential dangers and risks when walking outside from their homes, as this will boost parental confidence in them.

3.1.2 Safety

Safety is the most common factor associated with youngsters walking to school independently. The majority of mothers are more concerned with potential threats such as accidents, traffic congestion, kidnapping, and other situations, resulting in an increased reliance on parents to send their children to school. One of the concern is the location of the school which is next to a main road where vehicles are fast and during peak times, it is heavily congested. However this perception is untrue based on the observation the road was a secondary road next to a main road and a collector road which connects the housing area with the school. According to our observations during school drop-off and pick-up hours, the road in front of the school is congested with cars and motorcycles belonging to parents. Intriguingly, none of the mothers truly understands that once

walking becomes the primary mode of transportation for students, the number of automobiles and motorbikes in front of the school will gradually decrease. Mothers were mentioning the safety factors which have concerned them the most such as the road accidents or any unpredictable situations happening to the children during walking to school. There were also mothers mentioning the lack of facilities and road-design safety along the school-routes which indirectly affected the children's safety such as the landscaping and street lighting. However, during observation and through the collective mapping, the researchers have found out that the condition of the tree are acceptable and properly planted on the road side.

However, the safety of their children takes precedence over the health benefits of walking for all mothers. None of the mothers are concerned about the health risks associated with the needs to walk to school. It is logical that mothers would be fearful and concerned for their children's safety, particularly on the road. The proportion of mothers who have faith in their children's abilities and allow them to travel to school alone based on their perceptions of their children's safety.

3.1.3 Age and Gender

Demographic factors such as age and gender could be a great influencing factor on the mothers decision making in allowing their children to walk to school. For instance, the children's age is highly affected by mothers decisions where the majority of the children who were in secondary school tend to engage more on active travel to school compared to those children in primary school. In terms of gender, the majority of respondents were concerned about their children's safety, although they were more concerned about their daughter's safety than their son's.

Children's age and gender are two main factors which are correlated and affected the respondents decision in allowing children's independent travel to school. Based on the discussion, there were two types of mothers which are (1) allowing their children to walk to school if they have reached a certain level of age and able to be independent and (2) not allowing their children to walk to school, especially daughters despite their age. A

mother disclosed the fact that parental obligations prevent her from enabling her daughters to walk to school together. She allows her daughters to walk and ride bicycles under her supervision.

3.1.4 Weather

The weather is discovered by the thematic analysis of the focus group discussion that influences the respondents' selection of transportation modes and their decision to allow children to walk to school alone. For instance, mothers brought up the issue of unpredictability of the weather, particularly during periods of rain or heat. Observing their children walk to school in the sweltering heat prompted the majority of mothers to send their children to school through personal vehicle rather than on their own.

Waygood, Taniguchi, Craig-St-Louis, and Xu (2015) discuss the history and entire walking school bus system in Japan in his study. In fact, the entire system was developed with a well-functioning structure involving many stakeholders, including the school, the parent, and the municipality government. In addition, parents play a significant part in maintaining children's safety by volunteering in the programs, taking turns ensuring children in the neighbourhood cross the road safely, and ensuring the walking environment for children is safe. This is a verified case study in which encouraging children to walk independently to school doesn't really require new infrastructure, but a robust programme to encourage children to walk. During the focus group discussion, the majority of mothers supported implementing a similar program to the one in Japan to foster children's walkability in Taman Ilmu, with a particular emphasis on safety and security. This reflected previously mentioned analysis: the greater the children's safety, the greater parental confidence and trust in their children's ability to travel independently to school.

But for the system to be successfully implemented, a few barriers have been discussed from the mother's perspective in terms of difficulties in obtaining cooperation from the stakeholders, such as the number of volunteers, the willingness to be part of the volunteers as one of the commitments, and ensuring the continuity of the system, which requires a strong community-based bond. A

mother who had previously participated in the school's community project was expressing her insights regarding the call for volunteer participation. It was a voluntary program with no reward, and it was discovered that no parents volunteered to participate, which could be a precursor to a similar situation in the future.

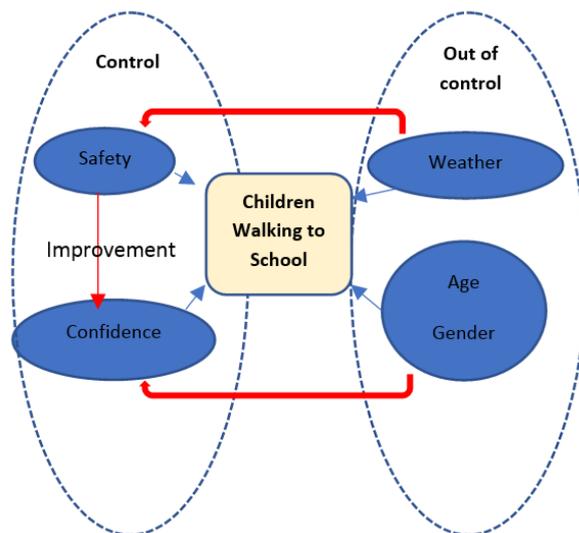


Figure 2. Relationship between the factors determining children walking to school

4. CONCLUSION

In conclusion, the mothers' group raised several salient points of discussion (Refer figure 2). With the used of a thematic analysis, we were able to classify the four most prominent themes concerning mothers' decisions to send their kids off to school on their own into two distinct categories. The first scenario is a "control" scenario, in which children's understanding of safety and confidence in walking to school on their own gradually increases as the government takes an active role in enhancing the necessary infrastructure and facilities. The school, the teacher parents association, and the local government can all play a role in boosting the confidence of mothers so that they feel comfortable letting their children walk to school on their own. Therefore, it is important to educate mothers about the benefits of walking to school, including its positive effects on children's physical and mental health, the immediate relief of traffic congestion near the school, and a reduction in the amount of carbon emission contributed by parents who send their children to school in private

vehicles. The improvement in the infrastructures and safety environment will contribute to the confidence level of the mothers as mentioned and discussed in the focus group discussion. As a result, the 'control' scenario can be significantly changed.

In contrast, the 'out of control' scenario raises some intriguing questions, as it suggests that many other researchers interested in the topic of walking in tropical climates may point to the weather as a deterrent in encouraging people to walk considering the high temperatures. However, local governments can intervene to make it safer for children to walk to school by installing shade structures along the route or building a roof over the path itself. The number of children walking to school in Nibong Tebal is not easily predictable by age group or gender. However, what can we do is with confidence of mothers. Given their mothers' trust in them, students as young as seven years old can walk to school without adult supervision, much like the walking bus system in Japan. In addition to the discussion, one of the respondents criticised the neighborhood's dispersed layout. Finding safe and appropriate routes for children walking to and from school will be tough. The majority of mothers believed that the existing infrastructure and services should be updated. Existing conditions of the pedestrian walkway are poor, with inadequate street lighting, resulting in a greater reliance on private mobility. In addition, there is a need for lanes that are specifically designed to accommodate the demands of walkers and cyclists. Therefore, the strategy can be implemented in Taman Ilmu if the required infrastructure and facilities are constructed. Implementing a walking-to-school proposal is crucial for several reasons, including : (1) gaining parental confidence and trust by recruiting a small number of volunteers to accompany and supervise children as they walk to school; (2) improving children's safety by improving infrastructure and facilities, particularly the road-safety design; and (3) encouraging more children to participate in physical activity. The built environment may also play a key influence in enhancing people's sentiments of safety and confidence. Therefore, to agree with Giles-Corti et al. (2011) that children are less likely to walk to school in neighbourhoods designed for high traffic

volumes, despite the fact that these neighbourhoods' interconnected roadway networks provide easy access to the schools. This demonstrates the importance of carefully considering school placement, land use planning, and road design in residential areas.

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