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CHILDREN’S INDEPENDENT MOBILITY TO SCHOOL IN MALAYSIA

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Abstract

The concept of children’s independent mobility encourages children to participate in physical activity through active transportation. Children’s Independent Mobility (CIM) is defined as the freedom for children to move around their surrounding neighbourhood without supervised by an adult supervision. Currently, there are some concerns about the decline in children’s levels of physical activity. Increased reliance on automobiles for children’s daily transportation can have negative effects on the environment, as well as increase the level of childhood obesity, and reduce their sense of independence. Research suggests that independent mobility to school is an essential component of a balanced childhood, and it has positive impacts on various aspects of children’s lives, such as physical health, social skills, and cognitive development. However, very few practical studies address the association between children’s independent mobility and school specifically. Investigating CIM in the specific context of children’s mobility to school is important because commuting between home and school is a major issue in active school travel. Adopting literature reviews as an approach, this paper will outline some recommendations that can be used by the relevant authorities in implementing pedestrian policies and guidelines for school children based on school accessibility and connectivity to promote CIM. From the literature reviews, this paper establishes a conceptual framework for the promotion of CIM to schools in the Malaysian context. It was found that most residential areas and school surroundings in Malaysia are responsive to children’s needs but parents’ mindsets hinder this concept to be successfully done.

Keywords: Children’s independent mobility, Active transportation, School, Accessibility

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INTRODUCTION

Children's independent mobility (CIM) refers to the ability of children to move around their neighbourhood without adult supervision (Chaudhury et al., 2017; Sharmin et al., 2017; Habsah et al., 2019). This concept encourages children to engage in physical activities such as walking or cycling to school and other destinations as well as outdoor play. Research shows that children with higher levels of independent mobility are more likely to engage in active travel, leading to improved physical activity and reduced reliance on motorized vehicles (Veitch et al., 2017). Independent mobility has positive impacts on various aspects of children's lives, including physical health, social skills, and cognitive development (Chaudhury et al., 2016; Qiu & Zhu, 2017; Riazi & Faulkner, 2018; Masoumi et al., 2020). However, limited studies have specifically addressed the relationship between CIM and school travel.

Physical inactivity among children can have serious consequences on public health. There is, nonetheless, a decline in children's physical activity levels worldwide, with less than 20 percent meeting the physical activity standards recommended by the World Health Organization (Schmidt et al., 2017). Engaging in physical activities such as walking and cycling can greatly improve children's well-being by preventing health issues (Lin et al., 2017; Sharmin, 2017; Veitch et al., 2017; Marzi and Reimers, 2018). However, only 8 percent of children and teenagers in Canada engage in the recommended 60 min of moderate-to-vigorous physical activity (Riazi and Faulkner, 2018). Similarly, in countries such as the United Kingdom, Canada, and Germany, only 20 percent to 45 percent of children and adolescents use active forms of transportation (Pérez, 2020). Additionally, Love et al. (2019) found that only 24.5 percent of Australian students aged 9–12 walked or cycled to school, while the remaining 75.5 percent travelled by motor vehicles with their parents. These statistics highlight the issue of physical inactivity among children, which can have serious consequences on public health. Lack of physical activity can lead to obesity, cardiovascular disease, diabetes, and other health problems in children and adolescents.

An investigation of children's independent mobility (CIM) in the context of traveling to school is crucial for creating environments that support children's freedom to move safely. This paper aims to provide a comprehensive overview of the promotion of CIM in schools in Malaysia. This paper will first discuss the general perspectives on children's independent mobility based on the existing literature to achieve this. Additionally, this paper examines the current state of CIM about school travel in Malaysia. Finally, the paper recommends policies and guidelines to promote CIM for schoolchildren, considering school accessibility and connectivity.

LITERATURE REVIEW

Definition and Indicators of Children Independent Mobility (CIM)

According to Hillman et al. (1990), "independent mobility" is defined as a child's ability to move freely outside of their home, engaging in active travel and outdoor play without the presence of an adult. Active travel, such as walking and cycling, can significantly contribute to a child's overall physical activity (Veitch et al., 2017). Some researchers have described independent mobility as a child's ability to move freely around their neighbourhood or beyond without direct adult supervision (Chaudhury et al., 2017; Lin et al., 2017; Sharmin et al., 2017; Riazi & Faulkner, 2018; Habsah et al., 2019). This includes walking or biking to school, visiting friends, playing in parks or other public spaces, and participating in age-appropriate activities that promote independence and socialization. Previous studies have shown that children who are free to play outdoors and use active modes of transportation without adult supervision are more physically active in their daily lives (Marzi & Reimers, 2018; Marzi et al., 2018; Masoumi et al., 2020). Independent mobility can be measured in various ways. There are four main indicators of CIM that have been mentioned in majority of the literature reviews namely, 1) Destination, 2) Territorial Range, 3) Parental License, and 4) Time Spent Outside.

Table 1: Indicators of children independent mobility from previous studies

Indicators	Descriptions	Citations
Destination	Various local destinations a child could independently travel	Chaudhury et al. (2016); Lin et al. (2017); Qiu and Zhu (2017); Marzi and Reimers (2018); Riazi and Faulkner (2018); Pérez (2020); Sharmin (2020); Hamad et al. (2022)
Territorial Range	Distance from a child's home to the destination during independent movement	Qiu and Zhu (2017); Lopes (2018); Marzi and Reimers (2018); Riazi and Faulkner (2018); Pérez (2020); Sharmin (2020); Hamad et al. (2022)
Parental License	Mobility licenses parents grant their child to move independently	Chaudhury et al. (2016); Qiu and Zhu (2017); Lopes (2018); Marzi and Reimers (2018); Riazi and Faulkner (2018); Pérez (2020); Sharmin (2020);
Time Spent Outside	Time a child stays outside of home without adult supervision	Chaudhury et al. (2016); Lin et al. (2017); Marzi and Reimers (2018); Pérez (2020); Sharmin (2020); Pelletier et al. (2021)

Source: Various literatures

Factors influencing Children's Independent Mobility (CIM)

Children's independent mobility is influenced by individual characteristics, with age and gender being the most influential factors (Riazi & Faulkner, 2018; Love et al., 2019; Hamad et al., 2022). Generally, the level of CIM is correlated with a child's age (Qiu & Zhu, 2017). Hamad et al.'s 2022 study found that age, gender, and socioeconomic background significantly impact children's home range and engagement in CIM-related activities in Egypt, as distance increases. In terms of gender, a study by Pelletier et al. (2021) found that not only does a child's gender influence their movement behaviours, but their parents' gender as well. Parents' decisions regarding CIM can sometimes be biased based on gender (Riazi & Faulkner, 2018; Masoumi et al., 2020).

The social environment includes the perceptions of parents and children regarding the safety of their neighbourhood and traffic. As guardians, parents are concerned about the risks of strangers and traffic accidents when their children are outside the house (Riazi & Faulkner, 2018; Pérez, 2020). Strong relationships with neighbours and a sense of belonging in a safe street network are crucial for parents to grant their children independence. This means that parental permission for their children to be independent and their perception of the neighbourhood environment are crucial concerning CIM (Marzi & Reimers, 2018). A study by Masoumi et al. (2020) found that parents are twice as likely to drive their child to school if they perceive the neighbourhood to be unsafe.

This paper categorizes physical environment into two factors: 1) built environment, and 2) neighbourhood environment. Built environment factors, such as distance, density, land-use mix, and urban design, all influence CIM (Riazi & Faulkner, 2018; Hamad et al., 2022). The neighbourhood is particularly important as it is often the first place where children encounter the outside world (Habsah et al., 2019). Children frequently travel to school from home, often causing parental concerns about their safety. To promote CIM to school, neighbourhood and school administrations should address these concerns and implement measures to ensure child safety. (Qiu & Zhu, 2017; Love et al., 2019).

The policy environment, whether at the national, state, or local level, has always been considered a crucial determining factor in the implementation of CIM (Riazi & Faulkner, 2018; Sharmin, 2020). According to Riazi and Faulkner (2018), countries with the highest rates of children who independently move around have laws that promote active transportation, such as walking and cycling. Therefore, governments must develop pedestrian guidelines and facilities in urban areas that align with the physical environment and the CIM concept to achieve sustainable policies (Sharmin, 2020). The policy environment for CIM is divided into various areas, including public health, education, transportation, public spaces, urban design, and housing, making it challenging to develop an integrated approach (Masoumi et al., 2020).

CIM Concept in Malaysia

The demand for urban transportation in developing countries is increasing, but there is still a need for safe, affordable, accessible, and sustainable systems. The Sustainable Development Goals aim to make cities inclusive, safe, resilient, and sustainable (United Nations, 2021). Therefore, UNICEF has launched the Child Friendly Cities Initiative to ensure children have the right to live in a safe, secure, and clean environment (UNICEF, 2018). In the national context, Malaysian government has taken steps to improve children's rights and well-being, such as establishing an independent Children's Commission and the Child Act 2001, which safeguards children's social and physical rights with parents and guardians are responsible for protecting children's well-being (Mariana et al., 2017).

Malaysia's reliance on motorized vehicles has led to environmental issues like air pollution, prompting a focus on promoting green mobility in urban and rural planning. The Twelfth Malaysia Plan (2021-2025) aims to promote green mobility in Malaysia, addressing environmental issues like air pollution. The plan prioritizes modes of transportation such as public transport, walking, cycling, and environmentally friendly vehicles (Economic Planning Unit, 2021). It also outlines strategies to reduce greenhouse gas emissions and promote active mobility and low-carbon public transport. The plan aims to improve accessibility, connectivity, safety, and reliability of public transportation. Research by Yong Adilah et al. (2022) suggests that more public transportation facilities are more likely to allow children to travel independently. Also, transit stations should be developed with a vibrant mix of activities to ensure effective and efficient service to the public (Nur Aulia et al., 2018). This approach is crucial for promoting green mobility and reducing greenhouse gas emissions in the transportation sector.

Malaysia faces challenges in integrating motorized transportation with walking and cycling, addressing declining independent mobility among school children due to lack of physical activity. According to Malaysian Health Minister, Dr. Zaliha Mustafa, four out of five Malaysian children and teenagers are not physically active (Bernama, 2023). As independent mobility is closely linked to active commuting, this physical inactivity is detrimental as it decreases the level of independent mobility. Malaysian cultural and social norms may discourage children's independent mobility due to safety concerns among parents, limiting their freedom to explore their surroundings. Typically, children in Malaysia do not walk to school, even if the distance between home and school is less than 1 kilometer, due to concerns about traffic risks (Eliani & Brimblecombe, 2022). Therefore, to promote independent mobility, this concept needs to be promoted so that society has a better understanding of its benefits. Unfortunately, research on independent mobility among children in Malaysia is limited, with few studies exploring parental perceptions of neighborhood environments and safety, impacting children's long-term development and well-being.

School Planning and Guidelines for Walking

The Malaysian government has established standards and guidelines for determining the appropriate walking distance to schools. In Malaysia, these standards and guidelines are provided by the Department of Town and Country Planning, also known as PLANMalaysia. These guidelines are used as a reference when planning and locating schools, considering their proximity to housing and other community facilities. The safety of school children, particularly when walking to school, is a top priority for the community. As a result, relevant agencies and stakeholders are working to reduce child pedestrian injuries in school areas. When selecting a school site, one of the main considerations is road access. It is important for the school to not be located near a major road or freeway. Figure 1 shows the walking distance between home and primary school, with the destination within 800 meters or 10 minutes. Children are more likely to commute if home distance is less than 1.6 km. Walking is an excellent way for children to accumulate daily physical activity, so schools should be developed based on population and catchment area.

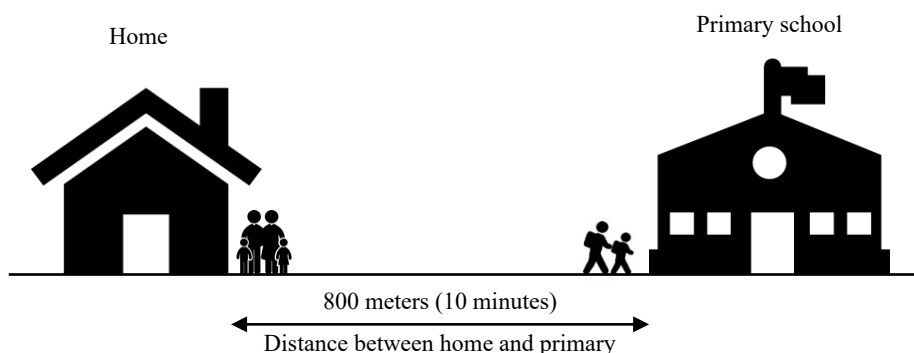


Figure 1: Walking distance between home and school
Source: PLANMalaysia (2022)

Meanwhile, Table 2 shows the specific guidelines on location and road for primary school. Literature suggests that key destinations should be within 400 to 450 meters (approximately 5 minutes of walking) of residential areas and 800 meters of public transportation (Intan Syuhana et al, 2014; Chaudhury et al., 2016). In ensuring the walkability of children, schools should be located near other supporting development components such as open spaces, shops, and recreational areas. According to PLANMalaysia (2013), the location of school is in the centre of the neighbourhood and mixed with other land-used categories such as open spaces, commercial areas, etc. Because a school is an educational facility, its location, design, and physical condition may be one of the most

critical factors in community planning. The location of the school is at the centre of the residential area and serves as the neighbourhood’s focal point (Qiu & Zhu, 2017).

Table 2: Specific guidelines on location and road for primary school

Criteria	Descriptions
Location Placement	<ul style="list-style-type: none"> • Distance from the intersection (minimum 200m) • Direct access to road 20.1m (66') (in residential area) • Close to residential areas and public transport transit (800m or 10 minute-drive)
Road Width (Minimum)	<ul style="list-style-type: none"> • Collector Road: 66' (20.1m) • Local Road: 40' - 50' (12.2m - 15.2m) • Special Lane (pick up and drop off): 50' (15.2m) <ul style="list-style-type: none"> - 3 spaces of bus lay-by (minimum 4m x 12m per space) - Parent/guardian vehicle zone

Source: PLANMalaysia (2022)

On the other hand, PLANMalaysia (2017) provided guidelines for the planning and implementation of a Healthy Walkable City at the city, town, and neighbourhood level or in any new development area. Healthy City was first introduced by the World Health Organization (WHO), where it promotes public health policy and sustainable development at the local level. One of the objectives of this guideline is to promote healthy living practices among urban residents by providing walking and cycling infrastructures to support active transportation. For school compounds, pedestrian footpaths and bicycle lanes must be provided with appropriate widths and must be considered safety factors. These facilities should also be equipped with support facilities, such as a covered bus stop and lay-by area for drop-off and pick-up, speed limit signs, and zebra crossings. Each pedestrian is different according to their age, gender, and physical ability; therefore, the planning and design of pedestrian-friendly cities should consider these factors. Table 3 shows the average walking distance and time of the children.

Table 2: Specific guidelines on location and road for primary school

Category	Age	Average Walking Distance (meter)	Time Estimation (minutes)
Children	3 to 6 years old	100 m	Average time 5 to 10 minutes
	7 to 12 years old	400 m	

Source: PLANMalaysia (2022)

Challenges for CIM in Malaysia

A recent study shows a decline in active transportation in Malaysia, leading to a decrease in green transportation options like walking and cycling (Mariatul Liza and Habizah, 2019). There were 66% of students chose to walk to school when

the distance was less than 1 km, while motorcars were a popular mode of travel for most students (Nurulhuda et al., 2020). In some cases, schools are located too far away from home; hence, children can't walk or cycle to school. In addition, findings from a study done by Tung et al. (2016), mentioned that more than one-third of Malaysian children were physically inactive. However, these studies only focused on active travel to school; whether active travel to other destinations such as shops, parks, and friends' houses increases children's daily physical activity is yet to be determined. Wong et al. (2016) and Tung et al. (2016) found that girls in Malaysia are less active than boys in physical education and outside-of-school activities. Again, these statements are only for physical activity, not specifically for active transportation, such as walking and cycling.

Active mobility among Malaysian schoolchildren is declining due to fear of crime and traffic concerns. Poor road safety, including improper pedestrian infrastructure and reckless driving, has led parents to consider private vehicles for transportation to school, resulting in a decrease in the popularity of walking and cycling (Ahmad Rasdan et al., 2018; Zaharah et al., 2022). Traffic congestion in Malaysia's urban areas is a common issue, with motor vehicles frequently dropping and picking up children. However, pedestrian negligence can also contribute to road accidents. For instance, some students intentionally violated safety regulations by not using pedestrian bridges (Ahmad Rasdan et al., 2018). Despite provisions for improper pedestrian infrastructure, these may not be fully utilized due to imprudent attitudes among pedestrians.

Malaysian parents frequently experience increased anxiety about the safety of neighborhood environments, which can potentially restrict their children's physical activity (Tung et al., 2016; Yong Adilah et al., 2022). Mariana et al.'s 2017 study found that 49% of parents in Klang Valley felt their children should walk within 100 meters of public areas, 31% perceived 400 meters as safe, and 20% felt 1 km was safe. In contrast, Liza and Habizah's 2019 study on urban children in Shah Alam revealed that parents still refuse to let their children walk independently to school, despite the home-school distance being less than one kilometer. On the other hand, children's gender could be a huge reason for influencing parents' decisions to allow children's independent travel to school. Malaysian parents prioritize their daughters' safety over their sons', according to Yong Adilah et al. (2022). Habizah et al. (2018) found that girls prefer parents' companions for safety, despite the minimal risk of stranger danger. Crime rates and cultural factors in Malaysian society, emphasizing traditional values, may also contribute to this concern.

RESEARCH FRAMEWORK

Methodology

This paper provides an overview of CIM from both global and Malaysian perspectives. The methodology used was a narrative literature review, which

covers a wide range of studies related to CIM. The techniques started by defining the topic, conducting a search for relevant literature, organizing structure, providing coverage of the topic, and lastly identifying gaps.

Theoretical Framework

A theoretical framework is fundamental to this research, which examines previous theories to identify relevant factors that determine CIM. Based on previous research, there are five primary factors for CIM: external, physical, social, socio-demographic, and individual (refer Figure 2). To explain children's mobility behaviour, three (3) well-established theories have been adopted in this research, encompassing the Social-ecological Theory, the Theory of Affordances, and the Neighbourhood Planning Theory.

Social-ecological Model

Bronfenbrenner's Theory of Ecological Systems emphasizes the significance of understanding human development within interacting systems. It suggests that children's independent movement can be studied from a social perspective, considering factors like family rules, neighborhood characteristics, and interaction between home and school environments. Therefore, both physical and social environments significantly impact children's mobility.

The Theory of Affordances

Gibson introduced the concept of affordances in 1979, which is linked to CIM, which involves identifying and using environmental means effectively. Affordances can be positive or negative, and their identification depends on an individual's developmental characteristics and the specific features of the space.

The Neighbourhood Planning Theory

Perry's 1929 neighbourhood unit concept emphasizes elementary schools in neighborhood planning and uses distance and population as guidelines for community facilities, transportation, and commercial activities. However, it's criticized for inadequate provision of community facilities and distant locations and lacks an illustration of the relationship between neighbourhood units and town centers.

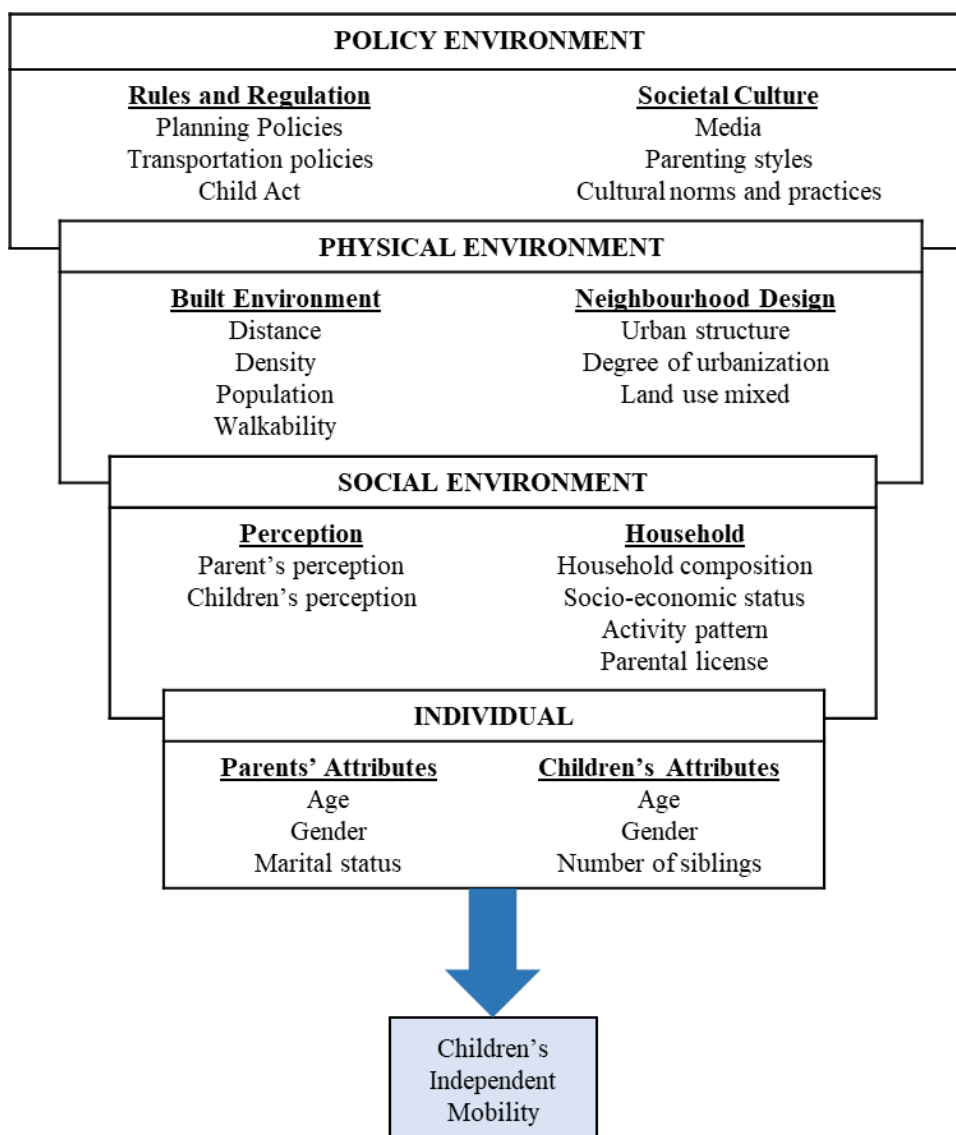


Figure 2: Factors influencing children's independent mobility

Source: Chaudhury et al. (2016), Lin et al. (2017), Qiu and Zhu (2017), Marzi and Reimers (2018), and Riazi & Faulkner (2018).

Conceptual Framework

School is a unique place among all accessible destinations for children. In this paper, CIM will be assessed to school. Active travel to and from school is a common mode of CIM. The conceptual framework in this paper incorporates factors influencing CIM to school. This paper identified policy environment, urban environment, and individual as variables in determining CIM to school. The proposed conceptual framework for this paper is illustrated in Figure 3.

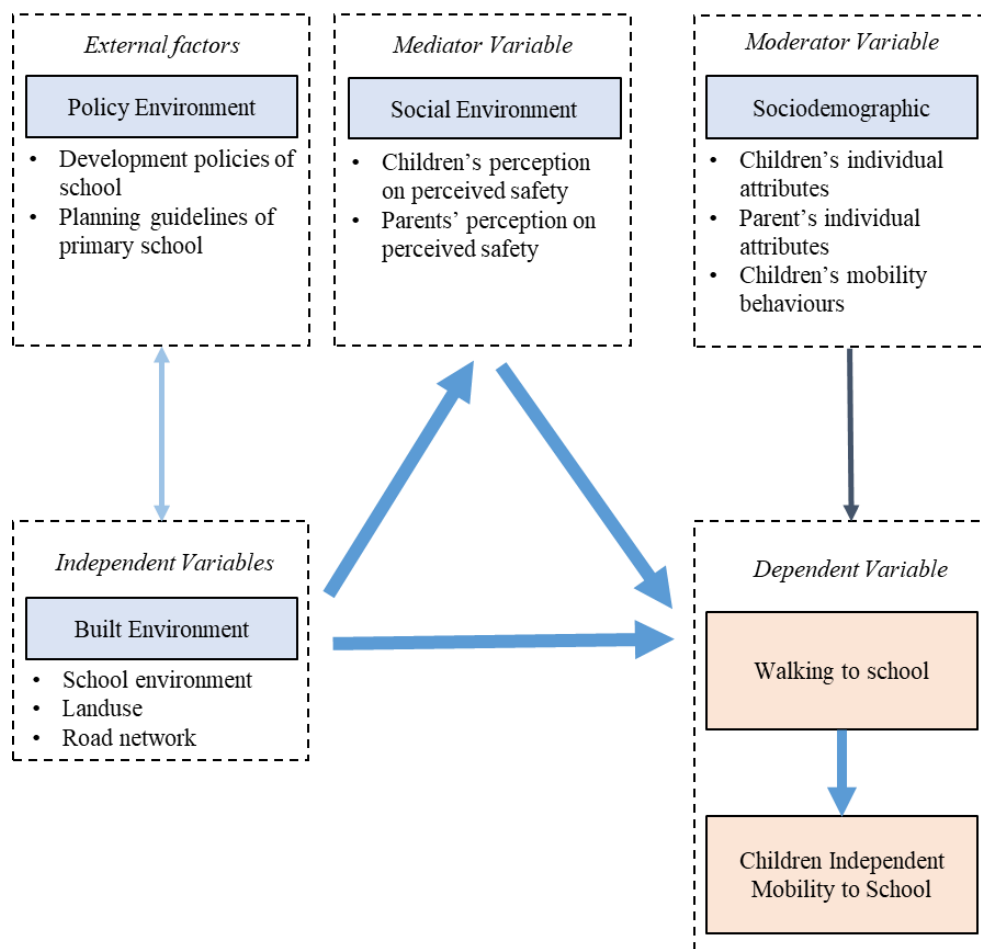


Figure 3: Proposed conceptual framework
Source: Authors (2023)

CONCLUSIONS

This paper provides a conceptual framework for the CIM concept in Malaysia. In a nutshell, the Malaysian government has tried its best to adapt the concept of CIM by implementing legal frameworks in consideration of the establishment of an independent Children's Commission from UNICEF. However, cultural norms in Malaysia prevent the adaptation of the CIM concept. Most parents still have doubts about allowing their children to move independently for safety reasons. Factors such as the built environment, traffic conditions, crime rate, and parental perception can affect children's ability to move independently in Malaysia. In addition, hot and rainy weather conditions in Malaysia also hinder the use of active travel (walking and cycling) among children. The lack of research in the Malaysian setting is not doing any good, which results in a lack of exposure to the benefits of CIM to the public. Therefore, research on CIM is crucial for understanding its challenges and opportunities in urban areas, especially in Kuala Lumpur, the capital city of Malaysia. Such research can help to determine areas for improvement in creating safe and accessible environments for children, particularly during school travel.

In terms of planning designs, it is suggested that school location and school catchment boundaries must be considered as key elements such as location, proximity, and accessibility to encourage active school commuting among children, thus promoting the CIM concept. Although the choice of travel mode varies depending on factors such as distance and local conditions, hence indicates that walking may not be the best choice among children. As previously highlighted, CIM is measured by the parental license, which is rarely granted to their children due to safety concerns regarding stranger danger and traffic risk. On the other hand, there are some strategies to promote CIM to school such as, 1) obtaining parental confidence and trust by exposing the values of active travel to school, 2) protecting children's safety by improving pedestrian infrastructure and road design, and 3) implementing green mobility initiatives, master plans and design guidelines at the local level, state, and federal level. Based on these strategies, the relevant parties need to work together to make the CIM concept successful in achieving sustainable urban living.

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