THE STATE OF CHILDREN’S INDEPENDENT MOBILITY IN BRAZIL

Aline de Melo Nascimento
Arthur Rodolfo Gomes de Oliveira
Yaeko Yamashita

ABSTRACT
In 1990, a research conducted in the United Kingdom and Germany by Hillman and Whitelegg aimed to explore children’s independent mobility, that is, the degree to which children of different ages are allowed to make trips to school and other destinations unaccompanied by adults. Using the same methodology employed by Hillman and Whitelegg, we conducted a survey sampling one city within each of the five Brazilian geographical regions. The purpose of this study was to determine the levels of children's independent mobility and the travel patterns of the students and compare our results with the ones of the study done in 1990. We found evidence that, on average, the parents who participated in our study, similar to the previous study, were allowed to go unaccompanied to school slightly earlier than their children. Statistics showed that the urban space is getting increasingly hostile what certainly imposes a limitation on children’s autonomy and quality of life.

1. INTRODUCTION
Early in the 1970s, Mayer Hillman directed a large-scale study at the Policy Studies Institute (PSI). Its purpose was to examine the personal mobility patterns of different social groups in Britain. It included surveys conducted in locations ranging from an inner London suburb to a rural village that were focused on British school children aged 7 to 15 and their parents, exploring how they travelled to school, visited friends, shops and other destinations and which mobility restrictions those parents imposed upon their children, the reason why such restrictions were imposed and until which age they were maintained. The country was divided into five regions and within each region the research was conducted in a junior and senior school, aiming to find out how children’s independent mobility changes over time and what are its implication for their personal and physical development (PSI, 2009).

The findings of the study showed that roughly half of the children’s journeys were made on foot and that growing restrictions were being imposed on their independent travel. The children’s parents were also involved in attitudinal surveys. They were asked about the age up to which they imposed personal mobility restrictions on their children and their reasons for doing so. Analysis of their responses revealed that factors influencing the willingness of parents to grant license to their children to get around on their own were linked primarily to concerns about the risk of injury on the roads and, to a lesser extent, about danger posed by strangers. Two PEP reports (then called PEP - Political and Economic Planning) incorporating the findings were subsequently published -Personal mobility and transport policy (1973) and Transport realities and planning policy (1976) (PSI, 2009).

John Adams and Mayer Hillman (1989) were motivated to return to this topic as a result of the United Kingdom Department of Transport’s Road Safety Division claiming that the substantial decrease in road casualties among children during the previous 20 years was indicative of the success of its policy. This follow-up study showed a dramatic loss of children’s independence over the previous two decades. For instance, in 1971, 80 per cent of 7- and 8-year old children travelled to school unaccompanied by an adult but by 1990 this proportion had fallen to 9 per cent (PSI, 2009).
Matching surveys in Germany were conducted to provide a cultural comparison. Germany presents similar conditions to the United Kingdom as both work with, relevant planning criteria, possess comparable levels of car ownership and so on. The results confirmed fears that the main reason accounting for children’s marked casualty reduction was not the implementation of the United Kingdom road safety policy but rather an increased restriction on the children’s personal autonomy outside their houses. It was also established that whilst levels of car ownership and use in the two countries were fairly similar, German children enjoyed far more freedom than their English counterparts. A report on the findings of the study was published in the PSI report *One False Move: a study of children’s independent mobility (1990).*

Brazil also presents high rates of accidents, lack of security policies for children and adolescents and an increasing number of vehicles and school buses, both public and private, to meet its demand. Our study attempts to determine how the autonomy and mobility pattern of children and adolescents is set, especially in relation to schools’ travels. To that end, we conducted a field survey in a city within each of Brazilian’s five geographical macroregions. It is thus important to mention that these cities were chosen according to the availability to perform data collection in order to identify the conditions for children’s mobility. Therefore is this paper divided into five sections: the first part presents concepts related to urban mobility, the second section defines what would be children's independent mobility, the third section discusses the steps of the methodology of the field, the fourth section describes the field research conducted in our five cities and the fifth section provides an analysis of the data from our field research evaluating children's independent mobility and comparing some results with those obtained in the surveys conducted in England and Germany.

2. MOBILITY

There are several definitions and meanings concerning the term urban mobility. For the purposes of the purview of the Brazilian National Department of Transport and Urban Mobility, mobility is an attribute associated with the city, corresponding to the ease of movement both people and goods are met with in urban areas. The concerning individuals may be pedestrians, cyclists, public transport users and drivers (Brasil, 2006b).

Mobility, far beyond of being just a matter of travel conditions and the usage of transportation, also reflects individuals' relationships with the space, objects, other individuals and is therefore the product of historical processes that reflect the cultural characteristics of a society. Mobility can also be affected by other factors such as the individual's income, his age, sex, his ability to understand traffic signalizations and his ability to use vehicles which can influence both positively and negatively the ability of one to move, temporarily or permanently.(Brasil, 2006b and Brasil, 2004).

Therefore, a mobility policy that would respect universal principles to bring benefits to the majority of the population could result into a more dynamic city, an improved movement of persons, goods and services and the strengthening of the main feature of an urban environment, which is a place of congregation for different people which a better mobility policy could help to turn into a truly public environment (Brasil, 2004).
2.1 Elements of Mobility
To deal with urban mobility as a public policy is to make efficient and effective use of integrative actions that could establish rules and standards for land use, public transportation, motorized means of transport and non-motorized means of displacement, particularly walking (Brazil, 2006a).

When the urban mobility policy effectively brings together all the key features involving the configuration of a city: its equipment, infrastructure, transport, communication, circulation and distribution of both objects and people; it participates actively in the development of such a city. The correlation between a city’s development and the mobility that is offered by such a city is evident.

The issues related to urban mobility are particularly interesting, since the limitations and difficulties imposed on various displacements reflect in diseconomies to the city. They directly affect the quality of life of its citizens and are crucial in determining social exclusion and inequality. However, social, economic and environmental agents associated with the mobility of people and goods were mainly ignored until now in the planning and management of urban transportation, where the focus has always been put into the physical access to means of transportation (Costa et al, 2006).

The cities are the stage of economic, political and social contradictions; its transportation system is an ongoing struggle between different agents: pedestrians, drivers, cars, trucks, buses and motorcycles. The existence of economic, social and, above all, physical (architectonic) barriers overtake the poorest and least protected individuals, whose accessibility to the urban spaces is dramatically reduced, preventing the free movement of people with disabilities and mobility restrictions (Brasil, 2006a).

2.2 Sustainable Mobility
Sustainable urban mobility can be defined as the result of a set of transport and movement policies aimed at effectively prioritizing non-motorized and/or collective modes of transportation, which do not generate spatial segregation, are socially inclusive and environmentally sustainable. Sustainable urban mobility should be integrated with other urban policies, with the larger goal of prioritizing the citizen in the fulfillment of their desires and needs, improving the general conditions of displacement in urban areas (Brasil, 2006b).

The use of non-motorized transportation can generate many benefits, improving the quality of life of its users. Litman (1999) expands on this topic, mentioning benefits such as an increased social interaction, more accessibility to leisure, increase of physical exercise, increased health and welfare and of financial and economical mobility. This translates to the community as increased public health and healthier communities, increased social interaction as a result of safer streets, the attraction of more tourists and a better touristical access to the city and the reducing of traffic congestion, air pollution and noise generated by the use of motor vehicle. The transport solutions should reflect the conditions, needs and preferences of users (Starkey et al, 2002).
3. CHILDREN'S INDEPENDENT MOBILITY
The study of children's independent mobility is relatively new. Soon after they have learned to walk, children seek to assert their independence by toddling away from their parents. Gradually they go further until they are granted a 'licence' to visit friends and/or neighbours or go on an errand that does not entail crossing a road. The acquisition of progressively more personal autonomy through greater independent mobility is an aspect of 'growing up'. It promotes self-esteem in children by permitting them to do things on their own. As children grow older, they are granted permission to cross roads alone, to go to school unaccompanied, to go to more distant places, and then to use buses and to ride bicycles on main roads. By the early teenage years, they are often treated as fully-fledged independent road users who are judged by their parents to have equipped themselves with sufficient skills to 'read' traffic and respond in sensible ways. By their mid-teens, virtually all of those who are physically fit have 'licences' to get around on their own, suggesting that there is a strict limit to parents' powers to curb the freedom of their children in the interests of safety (Hillman et al, 1990).

Much of the literature regarding children's independence focuses on the question of emotional and physical dependency. Responsibility is essential for the development of self-esteem. The practical ways in which the world outside the home may impinge on children's development are less well documented (Hillman et al, 1990).

Child psychologists stress the importance of facilitating the development of children's independence by allowing them new freedoms when they are ready to cope with them. From a position of total dependence at birth, there is a gradual detachment from the carer until a point is reached at which the child/adult is reckoned to be able to make his own decisions and run his own life. If the child has insufficient opportunity for independence in his early years, he will, paradoxically, remain dependent for longer than would be normal. If he is not able to avail himself of opportunities for independent action as and when they arise - is 'overprotected' - his horizons may be narrowed and he may find himself in difficulties when he is no longer protected (Hillman et al, 1990).

4. FIELD RESEARCH METHODOLOGY
The inquiry form adopted is adapted from the one used in field research in the United Kingdom and in Germany by Hillman and Whitelegg. In this section we present the methodological procedures based on the sustainable mobility and children's independent mobility, which will guide the collection and analysis of the data for further evaluation. Hence, the methodology adopted in this work consists of five steps, as shown below:

Step 1 - Defining the study area: The study area of this project is focused on primary and secondary schools in five municipalities within each Brazilian geographical macroregion. Table 1 below lists the cities where our research was conducted:

<table>
<thead>
<tr>
<th>Region</th>
<th>Municipalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southeast</td>
<td>Mangaratiba – District of Muriqui - RJ</td>
</tr>
<tr>
<td>South</td>
<td>Castro – PR</td>
</tr>
<tr>
<td>Midwest</td>
<td>Taguatinga - DF</td>
</tr>
<tr>
<td>Northeast</td>
<td>Santa Rita - MA</td>
</tr>
<tr>
<td>North</td>
<td>Marabá – PA</td>
</tr>
</tbody>
</table>
Step 2 - Sample Description: In this step we will define which criteria we used to sample the participants and how many participants we worked with. To this end, this step is divided into: (i) Defining the target population: students aged 7 to 15 years and their parents, (ii) Sampling techniques: Sampling by trial and intentional non probability sampling and (iii) Sample quantification: As in the United Kingdom and in Germany, Brazil was divided into five regions and within each of these regions one municipality was selected at the convenience of the researcher. In each school, questionnaires were applied in classes of the second year to the ninth year. Each class had on average 30 students.

Step 3- Development of the Research Instruments: This step concerns the adaptation of the forms proposed by Hillman and Whitelegg (1990) to our research. There are two questionnaires: the first one was applied to the students, where the focus was to see how they go to school, and the second one was delivered to the students for them to pass it on to their parents and which we collected at school the next day. They were both fundamental to our research, helping us identify how their children go to school and how they went to school when they were children themselves.

The research instruments attempted to provide answers to these questions: in the students’ questionnaire we asked their age and sex, how and with whom they went to school on the day of survey; if the student was allowed to cross roads, streets or busy highways by themselves and, if not, if they would like to have permission to do so; if they had a bicycle and if they were allowed to ride a bicycle on roads, streets or busy highways and finally, if they were allowed to ride the bus on their own.

In the parents’ questionnaire we asked what were their level of concern about the risks of traffic accidents their children could be exposed to when they cross a road, street or busy road; if they allowed their children to go to school unaccompanied and starting at what age they allowed or will allow it; we also inquired about the age at which the parents themselves were allowed to go unaccompanied to school when they were children and if they allowed their children to go out after dark and if not, what was the main reason for this.

Step 4 - Data Collection: Concerns the application of the research instruments and the collection of the required information. However, before such application takes action, we were required to perform some preliminary steps: (i) the definition of the research schedules and planning (ii) the preparation of the logistics for our travels to the study areas. While we administered questionnaires in each school we visited, the number of questionnaires distributed in each school was not the same due to the variation of students in each school.

Step 5 - Data Analysis: The data obtained from the surveys was summarized in a databank, and tested in order to analyze the quality of the information and the coherence and consistency of the data. Once the data was computed, we conducted and analysis in order to answer our fundamental question concerning the level of children’s independent mobility and proceeded to compare it with the results obtained in the United Kingdom and in Germany.
5. FIELD RESEARCH
As the studies realized in Germany and in the United Kingdom, our study done in Brazil was also conducted in five different regions: North, South, Northeast, Southeast and Midwest. It is important to remind ourselves that Brazil is about 24 times bigger than Germany and 35 times larger than the United Kingdom while the Brazilian population is 2.5 times the population of Germany and 3 times the population of the United Kingdom. This means that we have in Brazil a more dispersed population in a territory much larger.

The municipalities that were objects of our analysis were characterized on the basis of existing transportation facilities and the result is presented in Table 2. The data listed in this table was informed by each municipality’s government. This data allow us to sort out the cities where one type of transport has a low frequency in our results due to the lack of such mean of transportation instead of a restriction of the children mobility imposed by the parents.

<table>
<thead>
<tr>
<th>Municipalities</th>
<th>Is intramunicipal public transportation available?</th>
<th>Are schools bused available?</th>
<th>Are there bicycle lanes in the city?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Castro - PR</td>
<td>Yes</td>
<td>Yes (only in rural area)</td>
<td>No</td>
</tr>
<tr>
<td>Marabá - PA</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Santa Rita - MA</td>
<td>Yes</td>
<td>Yes (only in rural area)</td>
<td>No</td>
</tr>
<tr>
<td>Taguatinga - DF</td>
<td>Yes</td>
<td>Yes (only in rural area) / Passe livre¹ (only in urban area)</td>
<td>No</td>
</tr>
<tr>
<td>Mangaratiba - RJ</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

¹ The "Passe Livre" is a zero-fare student bus pass that grants free access to public transportation for students living further than one kilometer from their schools.

6. EVALUATION OF CHILDREN’ INDEPENDENT MOBILITY
This analysis aims to reveal how the students’ mobility occurred and the degree of autonomy and independence of the students’ mobility. Also, there is a possibility to confirm if in Brazil the level of ‘licenses’ granted to the students are related with their parents’ concerns about their safety and the risks of accidents they might suffer.

In total 1,629 forms were collected, of which 993 were completed by the students and 636 by their parents. With the cooperation of school leaders and teachers of the classes surveyed, it was possible to get 100% return of the students. The return of parents’ questionnaires from the junior schoolchildren was 68.4% and, from the senior schoolchildren, 60.1%. Table 3 contains a brief description of the sample.

<table>
<thead>
<tr>
<th>Classes</th>
<th>Total of students’ questionnaire</th>
<th>Average age of students (years)</th>
<th>Sex</th>
<th>Total of parents’ questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>2º to 5º grade</td>
<td>424</td>
<td>8,83</td>
<td>Female</td>
<td>290</td>
</tr>
<tr>
<td>(junior schoolchildren)</td>
<td></td>
<td></td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Didn’t answer</td>
<td>8%</td>
</tr>
<tr>
<td>6º to 9º grade</td>
<td>569</td>
<td>12,83</td>
<td>Female</td>
<td>346</td>
</tr>
<tr>
<td>(senior schoolchildren)</td>
<td></td>
<td></td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Didn’t answer</td>
<td>9%</td>
</tr>
</tbody>
</table>
6.1 traveling by foot on their own

Only two aspects of the survey to measure children's independent mobility were selected. The first one relates to 'licenses' or 'permissions' that children got from their parents to move around by foot - on their own - to cross streets and go from home to school alone. The second aspect concerns the 'licenses' or 'permissions' children under the age of 16 received to make use of mechanized mobility as to use their bike on public roads and permission to ride a bus. It was expected that the number of 'permissions' that students receive would increase with age. According to Hillman et al (1990), adolescents aged between 11 and 15 years enjoy a far greater independence than junior schoolchildren. These results are described in Table 4 and compared with those in the United Kingdom and Germany by Hillman et al (1990).

<table>
<thead>
<tr>
<th>Country</th>
<th>Classes</th>
<th>Locomotion by foot predominantly on their own</th>
<th>Mechanized mobility for children under the age of 16 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cross streets alone (%)</td>
<td>Go from home to school alone (%)</td>
</tr>
<tr>
<td>Brazil (2010)</td>
<td>2º to 5º grade</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>England (1990)</td>
<td></td>
<td>51</td>
<td>35</td>
</tr>
<tr>
<td>Germany (1990)</td>
<td></td>
<td>75</td>
<td>91</td>
</tr>
<tr>
<td>Brazil (2010)</td>
<td>6º to 9º grade</td>
<td>71</td>
<td>41</td>
</tr>
<tr>
<td>England (1990)</td>
<td></td>
<td>97</td>
<td>87</td>
</tr>
<tr>
<td>Germany (1990)</td>
<td></td>
<td>96</td>
<td>99</td>
</tr>
</tbody>
</table>

* Percentage of students who already have bicycles and can ride them on public roads

As expected, the 'licenses' or 'permissions' obtained by the students increased with age, students from 6th to 9th grade (senior schoolchildren) enjoy greater independence than students from 2nd to 5th grade (junior schoolchildren), except in the case of displacement by bus, which decreased with increasing age. The mobility by bus was also the one with the lowest percentage of use in both groups in Brazil. It is also observed that the percentage of 'permissions' in virtually all modes is lower in Brazil than in the other two countries, except in the category cycling on public roads.

It appears that in England that these percentages are almost always lower compared with those of Germany and then even smaller in Brazil. This shows that locomotion on foot on their own, which represents the autonomy or independence in children's mobility, is much higher in Germany for junior schoolchildren. The presented results are consequences of decisions made by parents using their insights on the question of the maturity of the child and the environment around this child.

Another item on the student’s questionnaire asked the children directly if they would like to have permission to cross roads, streets or busy highways on its own if they did not have it yet. It was observed that 36% of junior schoolchildren and 68% of senior schoolchildren who did not have permission to do so, would not like or wish to have permission to do so. This can be interpreted as an insecurity of students or a feeling of ineptitude concerning the realization of this activity alone.
6.2 Travel Patterns

We also examined the travel patterns of the students going to school. The by them most commonly used means in their school day can be seen in Figure 1 for students in the 2nd to the 5th grade (junior schoolchildren) and Figure 2 for students from the 6th to 9th grade (senior schoolchildren).

In Marabá more than 90% of the interviewed students go to school by foot. In Mangaratiba and Santa Rita we could also observe a high percentage (higher than 50 per cent) of students who go walking to school. The use of bicycles is not significant in the cities of Castro and Taguatinga. On the other hand, Santa Rita had the highest percentage of students using bicycle, just over 20%, although it was reported by their government the inexistence of bicycle paths and of any policies to stimulate the use of bicycle by the population.
In Marabá more than 90% of the senior schoolchildren go to school by foot. In Mangaratiba and Santa Rita we could also observe a high percentage of students who go walking to school, again more than 50%. The use of bicycles is not significant in the cities of Castro and Taguatinga, and Santa Rita had the highest percentage of students using this type of transport, just over 20%.

It is easy to observe in the second chart that the percentage of students who go to school by foot has increased substantially in relation to the junior students’ in the cities of Mangaratiba and Santa Rita. The opposite happens in the city of Marabá, where traveling by foot has decreased and the percentage of bicycle, car, bike and public transport has increased.

The visited cities have certain peculiarities. The school bus in Castro usually takes students from rural areas to the school, situated in an urban area. There is a high percentage of parents who prefer to pay for private transportation instead of allowing their children to ride on the school bus. The reason given by some teachers is that some parents are afraid their children could be victims of bullying.

Also, the small size of Muriqui justifies the lack of public transportation and school bus within the district. The use of both public transport and school buses would be made by school children who reside in other districts or other regions and are studying in schools in the district. Taguatinga was the only place where most junior children were driven to school and where most senior students use public transportation. In this city the public transportation is free for students going and coming back from school.

6.3 The Question of Independent Mobility
We verified if the children had access to independent mobility by analyzing if the parents allowed their children to go to school unaccompanied, as well as by checking the average children’s starting age that they did allow it or were planning to do it. For comparison we will point out the average age at which the parents themselves were allowed to go unaccompanied to school when they were children. The result is shown in Table 5.
Parents who participated in this study were allowed to go unaccompanied to school when they were children earlier on average. These results point out results applicable to a small town, which are usually more secure. Perhaps these numbers would be different if the survey was conducted in larger cities, since statistics and other studies show how urban centers are increasingly violent, leading to an overprotective behavior by the parents.

An extra analysis tried to determine whether parents allow their children to go out after dark, in an attempt to identify the perceived security of the environment in which they live. The result can be identified in Figures 3 and 4.

What is remarkable about this chart is the fact that 92% of the parents of senior schoolchildren do not allow their children to go out after dark. Our last analysis tries to link the mobile phone usage by the children to an increase of the perceived security by their parents and a possible factor influencing the easiness at which they would grant extra permissions on a child’s independent mobility. Around 36% of the parents informed that they child carried a mobile phone while 58% said that they child did not carry one. 6% of the answers were either left blank or incompatible. For the parents

<table>
<thead>
<tr>
<th>Classes</th>
<th>Parents who allow their children to go to school unaccompanied (%)</th>
<th>Age average that they have allowed it</th>
<th>Parents that do not allow their children to go to school unaccompanied (%)</th>
<th>Age-average that they will allow so</th>
<th>Parents who did not answer the question questionnaire (%)</th>
<th>Age at which parents were allowed to go unaccompanied to school as children</th>
</tr>
</thead>
<tbody>
<tr>
<td>2º to 9º grade</td>
<td>60</td>
<td>10,13</td>
<td>35</td>
<td>13,68</td>
<td>5</td>
<td>9,79</td>
</tr>
</tbody>
</table>

Figure 3: Parent’s allowances concerning children going out after dark.
saying that their children did carry a mobile phone, figure 4 shows the results for when the parents were questioned if the fact their children had a mobile phone made them more confident about letting they go out alone.

For 45% of the parents the usage of a mobile phone by their children did make them feel more secure about their children independent mobility what may hint at the possibilities technology could bring in the improvement of quality of life of individuals.

7. FINAL CONSIDERATIONS
Brazil is a country marked by deep inequalities and an enormous socio-spatial diversity (Brazil, 2004). Using the same methodology employed in the United Kingdom and in Germany by choosing only one municipality in each geographical region to conduct our surveys turns out not to represent the totality of a region and consequently, of the country.

In light of the resources and time available it was not possible to work with a larger sample. However, it was observed that the 'licenses' and 'permissions' that children are granted in time is related to parental concern about their safety. Parents are primarily responsible in determining the level of children's independent mobility. It is likely that a broader research with a larger sample will generate results that could be more informative about restrictions in the autonomy of children and their wider consequences. It is possible within our study to ask some challenging questions for politicians and society as a whole: how can we create environments beneficial to the physical and social development of our children? How to improve their health prospects and quality of life and, consequently, help in public policies development? According to Menezes (2006), to reverse the situation it is necessary that for a city to be well planned, inspiring confidence, allowing easy mobility, economy, safety and comfort. In order to achieve this it is necessary to: develop continuous, safe and well built networks for pedestrians and cyclists, without architectural barriers; create an integrated public transport network offering ease of access to exclusive lanes wherever necessary; improve the distribution of gardens, recreational areas and playgrounds with easy
access, good visibility and surveillance, embedded in these networks for pedestrians and public transport.

The challenge now is to build more inclusive cities, where not only the interests of a part of the population are taken into account but rather the needs of families and citizens as a whole. This could reflect in a less hostile urban space and thereby improve our society's autonomy and quality of life.
REFERENCES


