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# The Road to School. The Barcelona case.

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## 1. Introduction

Two or three decades ago, the mobility of young people between six and ten years old was similar to that of their parents (Tonucci, 1979). Today, several studies (e.g., Salmon, Timperio, Cleland, & Venn, 2005; Van der Ploeg, Merom, Corpuz, & Bauman, 2008; McDonald, 2007) assess the decreasing rates of walking and cycling between home and school in developed nations via its substitution by the car. Armstrong (1993) finds that 50% and 30%, respectively, of girls and boys aged between ten and sixteen are regularly driven by their parents, who walk less than ten minutes a day. Parents tend to control most of their children's experiences, depriving them of many opportunities to take some calculated risks or to endure long periods of solitude (Tonucci & Rissotto, 1999). Thus, more consequences exist. In 2001, the US Department of Health and Human Services (USDHHS) observed increasing rates of overweight status and obesity among children during the last ten years. Trost (2005) stresses that transport is fundamental for children's mental skills, with development of psychosocial skills, facilitation of cognitive skills (Burdette & Whitaker, 2005; Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004), and social prowess (Ginsburg, 2007) or emotional intelligence (Bunker, 1991). Rissotto & Tonucci (2002) comment that reduced mobility in children delays development of spatial and navigational skills, as well as a sense of community (Prezza, Alparone, Cristallo, & Luigi, 2005; Prezza & Pacilli, 2007).

Parents who drive their children to school elicit environmental and social impact as well. Their decision to promote vigorous efforts to reduce carbon emissions and lessen our dependency on fossil fuels, thus combatting climate change (Bauman et al., 2008), was recently recalled in the 2015 United Nations Climate Change Conference held in Paris. The air tends to become more polluted, the city becomes noisier, traffic increases, and streets become more dangerous for pedestrians. Children's disappearance from city streets also represents a serious handicap for the city itself. If there are no children around, public spaces can be converted to traffic lanes and parking slots, which is already occurring in various American cities (McDonald & Aalborg, 2009). The city loses its character as a place to meet others, people stay in their homes, and the fear of crime increases (Prezza et al., 2005).

Nevertheless, many studies conducted in Sweden, the USA, and Italy (Jansson, 2015; Jansson & Ramberg, 2014; Kremer-Sadlik, Izquierdo, & Fatigante, 2010; Tonucci, 2009) stress young people's role as "active citizens," while defining them as people who realize their rights, exercise their responsibilities, have access to political institutions, and share a sense of belonging to the community, both national and local. In this vein, such a perspective considers children as bystanders who cannot contribute a voice in social institutions, or mature normally as a result. Brondi, Sarrica, & Nencini (2012) comment about an initiative where young people

of the Chiampo Valley in Northeast Italy provide the community with concrete proposals for environmental protection, offer solutions to the area's problems, and take part in decision-making processes. Like adults, they are conscious of environmental challenges and consider pollution as an urgent problem for their surroundings.

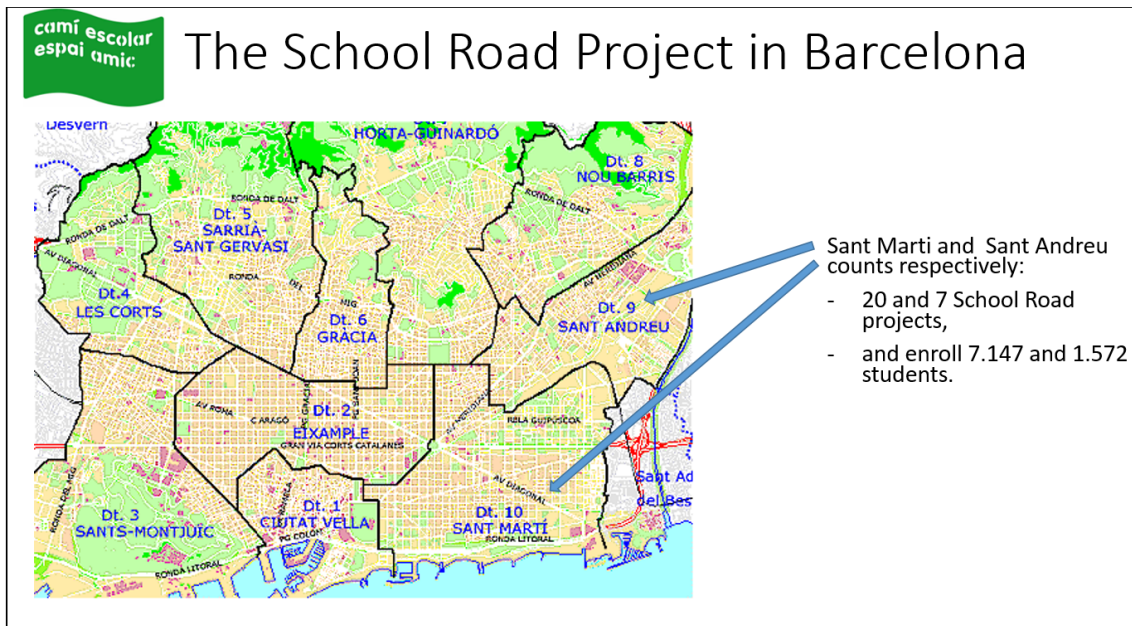
Moreover, Lúcio & Anson (2015) argue that children cannot only be considered as a resource for assessing the quality of life within communities, but as a starting point for more inclusive projects (Tonucci & Rissotto, 2001). Tonucci (2009) adds that a child's perspective is more inclusive than that of an adult, and how a child can gather issues and relations in a more inclusive way. His conclusions stress the importance of including children in all city rules. However, Dallago, Cristini, Perkins, Nation, & Santinello (2010) list some of the challenges that limit the engagement process with the young generation and highlight a collaboration with associations, local councils, and teachers, since this kind of cooperation is usually perceived as time-consuming but low-efficiency.

We believe that the Italian psychologist Tonucci (1999) provides many of the best initiatives involving children's participation as instruments of change for the city. Among them, we first mention the "Children's council" project, where those in fourth and fifth grade discuss various themes and political strategies for town development. Second, in "participated planning," students seek to improve the urban environment with the support of teachers and urban planners. Through these actions, children's confidence increases, and restores their autonomy in the streets and squares. The initiative started in 1991 in the small Italian coastal town of Fano, and was copied by different European countries (under different names). In Spain, it was first introduced in Madrid and Barcelona in 2000 and called "el Camino Escolar" (the School Road in English from here on). The city of Barcelona, considered among the top 5 Smart Cities in the world, according to the 2015 Forbes ranking (Grimaldi & Fernandez, 2016), has been pioneering the development of this initiative. Nevertheless, to the best of our knowledge, no scientific assessment has been conducted to analyze the difficulties and challenges of such a project. Therefore, the objective of our study is to identify, prioritize, and classify the barriers against development of the School Road project.

## 2. School Roads in Barcelona

Since 2000, the Department of Education of Barcelona City Hall (IMEB) launched several projects to improve education and mobility of the younger generation. Some were designed to exist inside the schools, while others related to activities occurring outside. At the end of 2015, 43,629 primary school students between third (8 years-old) and sixth grades (11 years-old) were involved in 136 School Roads projects. *Sant Marti* and *Sant Andreu* districts counted 20 vs. 7 of these projects, with 7,147 and 1,572 students enrolled. In terms of magnitude, they are the second and third most important zones behind *Sarria-Sant Gervasi*, situated in the Northwest part of the city. Figure 1 locates these districts on the Barcelona city map. We also split 136 projects into four phases, each describing a different maturity level. At the end of 2015, 22 were in phase 1 (lowest level of maturity), 17 were in phase 2, and 81 were in phase 3, although no one reached the fourth or highest phase.

Figure 1



The first phase encompassed preliminary actions required to ensure the launch of the project. It aligned all stakeholders in terms of restating the objectives, and defined the organization and management system with different committees. It outlined the method of work, as well as the place and frequency of meetings. One of its main outcomes was the commitment of different members, who took part in the direction of the school, its municipal services (City Hall, the police department, etc.), with both parent and neighbor entities (such as the parents' association) – who were all committed to other endeavors. The second phase entailed how information was recompiled about student habits, and ways to move in the district, given the perception of insecurity and conflicts identified. The information was analyzed with a study of the configuration and condition of the streets of this borough, including the surrounding of the school and the main roads to reach it. A report was requested to improve the services of Barcelona's street maintenance.

The third phase shared results of the analysis (even though committees regularly met during the previous phases of the project) in order to validate an action plan for the required actions. One of the first actions was to clearly identify the main (and most direct) access to the schools by painting the zebra crossings green (see Figure 2). Phase 3 also provided families with a map of streets in good condition. This was usually called the green spider network, because it was printed on green paper (see Figure 3).

Figure 2

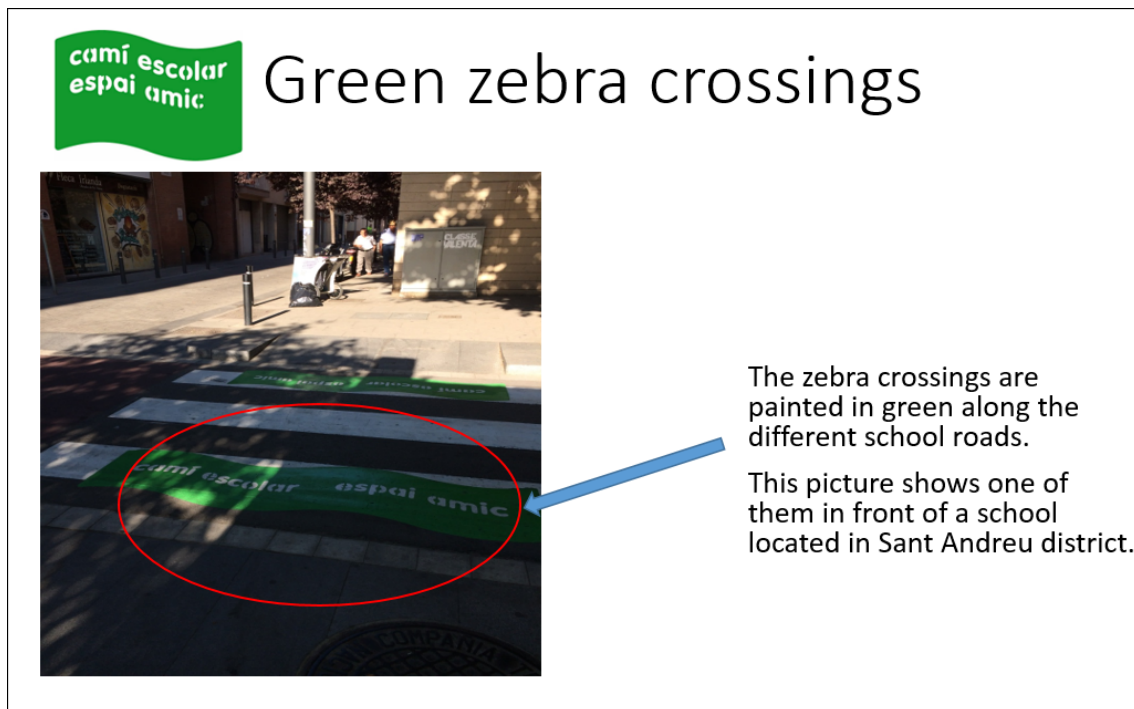
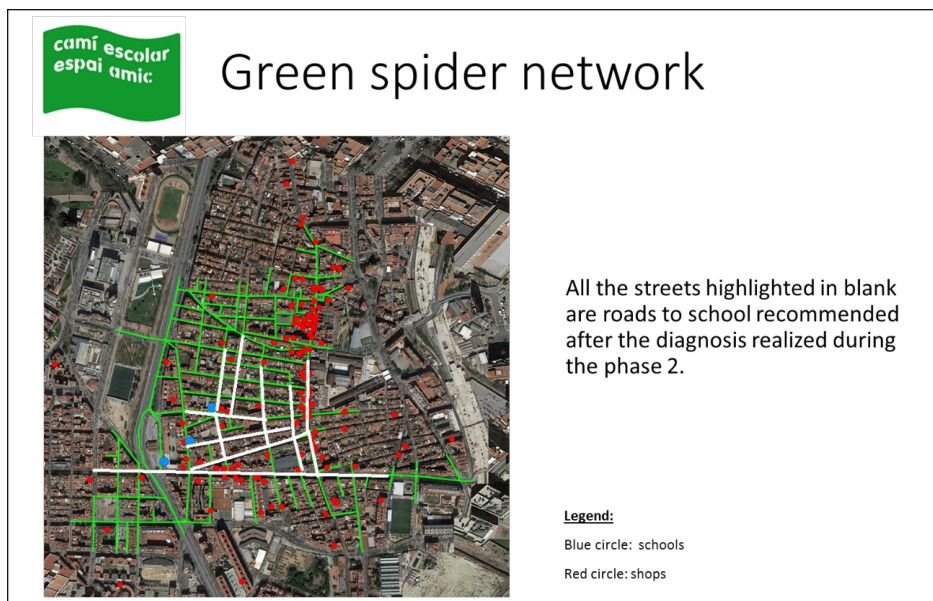


Figure 3



The project began with a school celebration. The fourth phase was dedicated to assessment and follow-up of actions started in phase 3 in 2016. Among the 136 projects launched, none of them reached maturity, despite a desire to evaluate their benefits.

### 3. Methodology

To respond to the research questions, we conducted an exploratory phase (section 4), and then a confirmatory analysis (section 5). The first was based on an interpretivist and inductive method, in which our primary information sources were interviews with different stakeholders in the education system (e.g., teachers, political issues, and parents). The second was fueled by conclusions of the first study, which included a list of barriers against the use of school roads. Data collection of the first part of the study involved a set of semi-structured individual interviews. As stated, the lack of original papers complicated the answers and transformed the study goals into a complex issue. Consequently, we decided to orientate our epistemological work by selecting and analyzing the case of Barcelona, or more specifically, two of its popular districts (*Sant Martí* and *Sant Andreu*, located on the eastern side), since both have a great deal of experience in the School Road project. *Sant Martí* has a population of 224,472 inhabitants, which makes it the second most populated district in Barcelona, with a size of 10.8 km<sup>2</sup>. *Sant Andreu* has a population of 145,678 inhabitants and a size of 6.5 km<sup>2</sup>. These data come from the recent 2015 Barcelona census.

In the first analysis, our data collection followed a non-probabilistic strategy of quota sampling. We engaged all project stakeholders: parents, parents' support organizations, the IMEB and the schools' faculty and staff. Wende (2007) defined specific roles in any project: responsibility, accountability, leadership, consulting skills, and informing the group (abbreviation RACI). We delineated Table 1 to map and verify that our quota strategy with 22 interviewees covered all possible roles. The parents' choice respected quotas in terms of gender representation, range of age, and at least 1 child "eligible" to be in the initiative, i.e., older than 8 years. Due to the nature of this research, all interviewees satisfied the following criteria: knowing the Barcelona School Road Initiative, being engaged in the roll-out of this initiative, and having lived for at least four years during the three earlier phases of the project.

The final sampling included four members from the parents' organization (called "Parents' Association," AMPA from AP1, AP2, AP3, and AP4), four managers in charge of this school initiative (S1, S2, S3, and S4), ten parents (four fathers: F1, F2, F3, F4, and six mothers: M1, M2, M3, M4, M5, M6, and four managers and technicians from the IMEB, directly accountable for this initiative (B1, B2, B3, and B4). Meeting with the parents took place at their homes for personal comfort. An unexpected event was that one of the fathers could not receive us according to the schedule of visits, so we decided to interview his wife (M1), so as not to forfeit additional feedback. All the interviews were done according to a protocol based on the recent works of Professor He (2013), regarding children's mobility. Our objective was to understand the scope and ambition of the initiative, along with enough experience for a holistic view of the project.

The protocol was a semi-structured interview with open-questions for one hour, to capture the barriers and drivers perceived by different stakeholders, and some possible unexpected results to redirect the interview according to them. The protocol was divided in four parts: the first was a short introduction with the authors, then discussing the study, and finally the definition of interview conditions. We explained that the interview would be anonymous and confidential, since parents may have been afraid to share their children's

concerns about going to school alone. This was also a good time to explain that we would not be pursuing any commercial objective (for instance, any financial issues regarding the inhabitants of the district). The second part aimed at checking their level of engagement in the project and validating their opinions related to the objectives of the study (that they are personally and directly concerned) and their experience (they have been involved for at least four years). We also collected demographic information, such as gender, age, and academic level. In the third part, we asked respondents to answer a series of pre-established questions. The questions were based on a set of barriers identified by Prezza et al. (2001), regarding the influence of psychosocial and environmental factors on children's independent mobility. However, we considered the questionnaire as semi-structured, since we asked open-ended questions for a range of variation in response. All respondents received the same set of questions in the same sequence. However, according to the new barriers and drivers added by the interviewees, we expanded the scope of our questionnaire for some of the interviews. The initial list looked at four barriers related to traffic density, infrastructure, low lighting, and sickness. In the interview process, respondents introduced new barriers like pavement condition, unsecured zones, fighting, adults with bad intentions, etc. So we decided to add to the questionnaire, validated by the next interviews. The interviewer plays a neutral role, never interjecting opinions about respondent answers, with a style of "interested listening" to gain trust. The fourth part deals with thanking them for accepting this meeting and sharing the information, offering valuable time but informing them that in the coming weeks a survey would be sent by importance the results obtained (section 6).

In addition, the interviews were saved with an audio recorder. The protocol included the annotation of interviewees' reactions (e.g., behaviors or nonverbal communication) while they were responding. The IMEB provided us with secondary sources of information during different meetings to improve our understanding of the initiative (e.g., the list of commercial shops by district committed to participate, different network maps with priority streets for getting to school, a report at the end of 2015 with the number of schools, students, and families engaged in Barcelona, and a complete work description of each phase). They indicated that this information was previously created to promote, support, and access the schools in conducting changes. The company ETCS (<http://etcs.coop/>) created it, for IMEB to respond to the demands of project documentation, generated by the schools.

We transcribed all interviews through the Express Scribe software, following a process of double peer review by the two authors of this paper. We added non-verbal communication to the text to remind us about the following analysis process. We codified the interviews through the methodological proposals of Bogdan & Biklen (2007), using qualitative data analysis software, MaxQDA (version 12). Initial interview coding was to identify the blocks and paragraphs where interviewees speak about barriers or drivers of the initiative (just two codes: BAR->Barriers and DRI->Drivers). We then assigned a paragraph (or a part of one) for a list of preconceived codes from our framework of the research. The initial list of codes contained 4 items (traffic, infrastructure, low lighting, and sickness), where the codes represented concepts of information transmission: challenges, drivers, barriers, or family concerns. The third and final step consisted in coding paragraphs with an inductive approach (encoding in-vivo), and recoding the same interview with better codes. The final code book contained 14 codes (e.g., traffic density, low lighting, hour of openings and closing, pavement, unsecured zones, fighting,

sickness, adults with bad intentions, etc.) grouped into six categories: traffic, infrastructure, fear, distance, “Youngest son,” and Project management (see Table 2).

We constructed a checklist matrix to organize the different components of each case. These matrices show different sources of data (interviews) in rows, with the codes in columns. They display the interviews of the codified elements and reliability, frequency, and importance, according to the number of sources that corroborated them. Consequently, we identified some gaps in the interviews, such as responsibilities of the different departments of Education (district area, IMEB, etc) that were not clearly understood by the families. We decided to meet parents who formed part of the neighborhood City Hall to clarify it. We also acknowledged some inconsistencies, e.g., how parent usually claimed that traffic density was an important barrier in not letting their children go alone. However, in some cases they preferred to drive them to school, encouraging the traffic congestion they feared. For this reason, we decided to interview four additional parents (F2, M3, F4, and M6), creating triangulation and validation of our previous findings. The first part of our study methodology allowed us to define a list of barriers (Table 1).

Having proposed a list of barriers regarding school roads, we conducted a second quantitative analysis, aimed at ordering them according to the level of importance from the parents’ perspective. We designed a questionnaire focused on the parents’ perspective, whose children were enrolled in one of the 123 school road projects. To improve this representative sample, we submitted the questionnaire to four schools of the *Sant Marti* and *Sant Andreu* districts. Each school has 1 class of students per academic year, with approximately 25 boys and girls per class. The potential number of answers was approximately 400. Two schools requested to present the motivation of the research study in person, and we were invited to do it during an “AMPA” monthly steering committee meeting. One school rejected participation without any kind of explanation, so that the purpose of the study would be clarified. One school asked for digitalizing the questionnaire, using a web-based survey tool inspired by a sustainable and paper-free strategy.

The original questionnaire was created in Spanish, given that it is the language of the authors. Since two schools requested it, the questionnaire had to be translated into Catalan as well. To ensure the accuracy of the translation, we followed a back-translation procedure (Nunnally & Bernstein, 1994). Moreover, five cognitive interviews were conducted to ensure accurate interpretation of the questionnaire items, as this technique allows for an understanding of how respondents perceive the questions, as well as identifying potential problems arising in a prospective survey questionnaire (Drennan, 2003). Cognitive interviews permitted us to interpret which items were beyond the framework of the constructs to be analyzed (Collins, 2003; Drennan, 2003). By means of verbal probing and thinking aloud (Somaya & Williamson, 2008), participants were asked their interpretation of the statements and to comment on the wording, towards the clarification of any ambiguous or poorly-worded questions. Based on this, minor stylistic and semantic changes were made.



**Table 1: typology of the two School Road projects**

“Sant Marti” area	Interviewees	Responsibility
Parents	F1, F2, M1, M2, and M3	Informed
AMPA. Association of parents	AP1 and AP2	Responsible
Manager of schools and responsible of the initiative	S1 and S2	Consult
Department of Education	B1*, B2*, B3	Responsible

“Sant Andreu” area	Interviewees	Responsibility
Parents	F3, F4, M4, M5 and M6	Informed
AMPA. Association of parents	AP3 and AP4	Responsible
Manager of schools and responsible of the initiative	S3 and S4	Consult
Department of Education	B1*, B2*, B4	Responsible

\* B1 and B2 are the managers in charge for the department of Education of the School Road project. They are common for both areas analyzed. However, each area has a technical person to locally support the initiative (B3 and B4).

The questionnaire had two parts. In the first part, demographic and background characteristics were collected to gain a deeper understanding of the composition of the sample. This information encompassed the gender, age, and education level of the respondents. Moreover, we collected the age of the children, their respective grade, and the average duration and distance between home and school. The second part included a list of twelve statements, which each of them related to one of the barriers identified in the first part of this study (see Table 3). We requested the parents to give their level of adherence to each statement and to grade it according to a Likert-scale between 1 (total disagreement with the statement) and 5 (total agreement with the statement). We also measured whether this initiative provided tangible results in terms of querying if the actions made them change their minds, i.e., to let their children go alone to school.

## 4. Exploratory analysis and identification of barriers

After analyzing the information, we identified traffic as the most common issue from the retrieved codes. Indeed, traffic density appears to be a large concern for families. It confirms previous studies on children’s mobility (Armstrong, 1993; He, 2013; Rissotto & Tonucci, 2002). Moreover, traffic and accidents are in the same paragraph in all cases. Eighty percent of the respondents refer to it, but express concern in different ways. Few of them referred to the insufficient number of speed controls or the scarce presence of police officers on the streets. They added that many cars exceeded speed limits of the district: 30 km/hour in pedestrian zones and 50 km/hour in general. Others referred to the borough as being old, with small pavement style and perpendicular crosses, which drastically diminished visibility and reaction time if a car arrived. The traffic concurs with the code “low lighting of the street” in 75% of all cases. The comments highlighted that in the winter months, children must go to

school before sunrise, increasing risk of accidents with motorized vehicles. Consequently, we suggested “traffic density” and “low street lighting” as two barriers of school road projects.

The second code our analysis revealed was related to infrastructure conditions of the borough. The two areas selected were large spatial transformations where green or no-urban zones are transformed to schools, residential buildings, or green parks. Our interviews showed the repetitive occurrence (70%) that unsustainable financial conditions of the public administration had reduced the maintenance budget for the streets, with many pavement areas suffering large zones of deterioration. One interviewee expressed himself with arm movements, which were recorded with a memo: “within the financial crisis in which our country is still immersed, our city has drastically cut its functioning budget, such that this austerity policy has reduced superfluous and other actions that guarantee minimum living conditions in the city and maintenance of our streets and green parks.” He added: “This situation cannot guarantee that children are always safe and secure, even if they walk respectfully on the street pavement.” Clark et al. (2010) stressed how efforts to create “walkable” neighborhoods are often promoted by decreasing the “automobility” which tends to divide workplaces from the home, in turn producing lengthy commutes, the split of home and shopping, as well as destroying local retailing outlets. Urry (2004) called this movement “Smart Growth” to build a greater number of pedestrian streets in the city. In spite of financial restrictions, all interviewees agreed that the achievement of phase 3 in both districts allowed for improvement in the access to school and that all information is shown in the respective street maps (spider network). We suggested that “small or damaged pavement needed to cross unsecured zones” as two additional barriers to school road projects.

The third code our analysis stressed was the health and integrity of the children during their way to school. Four types of fear are registered and classified as four sub-codes: F2, F3, M2, and M3 mentioned their fear that their children could meet an adult with bad intentions or that their children might fight with others. F3, F4, M2, M3, and M4 stated they were afraid that their children might feel sick on the way to school without finding any support if they needed it. “Fear” words appear 66% in all meetings. Three fears appear simultaneously in 33% of all cases, while only two interviewees (F4 and M2) mentioned all four types of fears during the 1-hour discussion. We decided to further analyze these two specific interviews (F4 and M2) and look for a common pattern between families. We found that they both live far from the school (more than 1 km) as well as in the most conflicted area of the borough. We proposed “Fear of meeting adults with the wrong intentions,” “fear of fighting with other pupils,” “fear of feeling sick on their way to school,” and “Fear of asking for support if they needed it” as four additional barriers to the school road projects. Carver et al. (2005) corroborated that parents bringing their children were commonly linked with road safety and perceived dangers from strangers. We asked if more security could be a solution, but all interviewees claimed that only distance informed their decision to use a car.

Distance is a repetitive argument identified in the revision of the interviews, plus 50% of the interviewees had mentioned it. Distance and traffic codes appear in 70% of the adjacent cases in the same paragraph, while in 20%, only one paragraph separates them. The parents argued that they prefer to drive their children to school, as they do not want them to arrive tired or late. This result confirms the decreasing rates of walking and cycling between home and

school in developed nations (McDonald, 2007; Salmon et al., 2005; Van der Ploeg et al., 2008). However, using a car appears to contradict the first main argument expressed during the interviews regarding traffic congestion and danger. We pay special attention to this paradox, but the interviews did not allow us to clarify it. Specific research on this issue should be developed in future work.

Interviewees unexpectedly commented that their interest and concern about environment and pollution are in contradiction with their behavior. Walking or cycling instead of driving as Bauman et al. (2008) highlight, are reasonable efforts which permit the decrease of the carbon footprint and its negative effects on the environment. Based on these comments, we redirected the remaining interviews, including a protocol question for 66% of the remaining interviewees (12 people), such that sustainability appears as an important concern they transmit to their children. We thus suggest “distance” as a new barrier.

In the third interview with parents (F3), we discovered a new barrier related to autonomy, which we called the “effect of the youngest son.” Indeed, families who still have a young boy or girl below 8 years feel compelled to bring them to school. For this reason, the eldest son or daughter, who should be able to go alone, still tends to be accompanied with the youngest son or daughter. One interviewee told us: “since I need to bring my little daughter to school, his brother comes with us and we can discuss various issues on the road.” We modified the protocol to include a question related to this effect with the results showing that 20% of the remaining interviewees (10 people) acknowledged bringing the eldest children due to the “effect of youngest son”. We consider this to be a barrier.

In our meeting with the Parents’ Association (AP1 to AP4), we perceived a large civic commitment coming from both districts. Other initiatives exist, for instance the “CitizenSqkm” program (Garriga & Medina, 2014), which is a communicative ecology project wherein digitized and geo-located information is collected, stored, and processed via a community network. The latter is made up of antennas, nodes and computers, as well as students, teachers, citizens, local entities, and public administrations like research centers. This online community network is designed to function as a decentralized entity, self-managed by community members with the goal of improving citizens’ lives. However, these associations agree that even if each School Road project varies by characteristics and constraints, the leadership must come from the parents and the school’s side in that case.

The members of the Parents’ Association added that *Sant Marti* is considered as a “success story.” Started 7 years ago, they have recently reached the largest number of initiatives compared to any other Barcelona district. Seventeen projects are in progress in phase 3. Behind this, the *Sarria-Sant Gervasi* district is the next one with 14 projects. They commented that this success is due to how parents who are satisfied with results of the initiative have been promoting its conversion into a complete and larger success. They believe accordingly, “this continuous and stable engagement is a real challenge.” Even if this comment is present in only two interviews, we consider it an important and sixth barrier: “the absence of project monitoring, which can measure and retro-feed the process, sees the gap between expectations and actual results and then determine corrective actions.” They consequently recommended that the Barcelona Department of Education develop a family satisfaction survey as an

assessment tool. This confirms Wang's (2001) study, which comments that the use of surveys and focus group discussions improves citizen satisfaction.

Finally, interviewees of the schools (S1 to S4) commonly stress a rigid documentation, which is usually not customized enough for their context. They stated that IMEB's action was missing a higher level of efficiency. They pointed to the resulting complexity to coincide different departments inside the same public administration (services of street maintenance, Department of Education and Department of Districts). Therefore, although this comment comes from four interviewees, we consider it as important and decided to include it in the previous barrier with the sub-code "the absence of project documentation adequacy, along with inefficiency of the City Hall organization and the governance model." Braem et al. (2013) highlight that open access solutions, like digital platforms, can improve governance, knowledge, and ownership of this citizen's initiative. It could be a possible answer. Finally, Table 2 shows a classification proposal of the identified barriers.

**Table 2: List of barriers classified in groups**

<i>Number</i>	<i>Group of barrier</i>	<i>Risks estimated for the children if they form part of the School Road project</i>
<b>1</b>	<i>Traffic</i>	<i>High traffic density</i>
		<i>Low lighting in the street</i>
		<i>Entering to school too early or going out too late</i>
<b>2</b>	<i>Infrastructure</i>	<i>Small or damaged pavement</i>
		<i>Crossing unsecured zones</i>
<b>3</b>	<i>Fear</i>	<i>Meeting adult with wrong intentions</i>
		<i>Fighting with other children</i>
		<i>Feeling sick in the street</i>
		<i>Feeling alone. No access to any adult for help</i>
<b>4</b>	<i>Distance</i>	<i>School too far from home</i>
<b>5</b>	<i>"Youngest son" effect</i>	<i>The eldest son going with the youngest one</i>
<b>6</b>	<i>Project Management</i>	<i>Absence of a project monitoring.</i>
		<i>Absence of project adequate documentation.</i>
		<i>Inefficiency of the City Hall organization and governance model.</i>

Our questionnaire was based on a set of barriers identified by Prezza et al. (2001), regarding the influence of psychosocial and environmental factors on children's independent mobility. Like environment factors, the authors mention low traffic density, low urbanization, living in a new or old neighbourhood, or in a building with condominium porches or courtyards,

adequate green areas (parks, gardens), or playgrounds. Like psychosocial factors, they mention fear of crime, neighbourhood relations, sense of community, and perceived risk of traffic. A clear match exists between these factors and our results, even if we identified and classified new groups of barriers, such as the infrastructure of the city, the distance between school and home, and the already explained phenomenon of “Youngest son.”

## 5. Prioritization and classification of barriers

The second phase took place with the delivery of the questionnaire to ask parents to order the different barriers raised in the first study, according to their level of importance. The respondents (31.25% men and 68.75% women) were anonymous. The average age of the respondents was 43.7 years old. Regarding education level, 63% went through university level and 31% and 5%, respectively, have secondary and primary degrees. The survey shows that the average age of children is 10.9 years (SD = 2.7), 43% of them going alone to school and 16% doing so on the School Road Initiative. On average, it takes them 9.1 minutes (SD 6.5 minutes) to go to arrive at school.

According to our study, the first barrier regarding this initiative was that it had to deal with the fear that children might meet suspicious people. The level of stress in relation to this was very high (4.1) and beyond the scope of the other concerns. It confirmed what many scholars (Burman, Brown, Tisdall, & Batchelor, 2000; Hillman, Adams, & Whitelegg, 1990; Matthews, 1995; Mullan, 2003) describe and call “stranger danger.” With reference to their own childhood, parents believe that children now face more risk due to adult or stranger presence (Scott, Harden, Jackson, & Backett-Milburn, 2000). The state of the infrastructure surprisingly resulted in being the lowest scored (low lighting = 3.1; pavement = 2.8 and unsecured zones = 3.2). These results must be interpreted in terms of the short path to school (9 minutes). This can also explain why these results can be contrasted to another qualitative study of 400 households by Valentine & McKendrick (1997) in England; it found that road safety and “stranger danger” had the same weight concerning the cause of restriction of children’s mobility.

Violence between pupils is similarly considered as a high barrier (fighting with other children = 3.4). Many factors may explain it. O’Brien (2011) analyzed the behavior of children who want to punish those who don’t conform to the norms of children’s social groups, which is usually called “bullying.” Based on a large survey from 8 mixed-sex British state secondary schools, she compared two styles of bullying in the literature. On the one hand, social scientists (Brooks, 1982; La Fontaine, 1991; Rigby, 1996; Thorne, 1993) have been studying group-based bullies, while others (Janoff-Bulman & Hanson Frieze, 1983) were analyzing effects related to individual-based bullies. She concluded that group-based bullying was more damaging and capable of generating violence between children that parents fear.

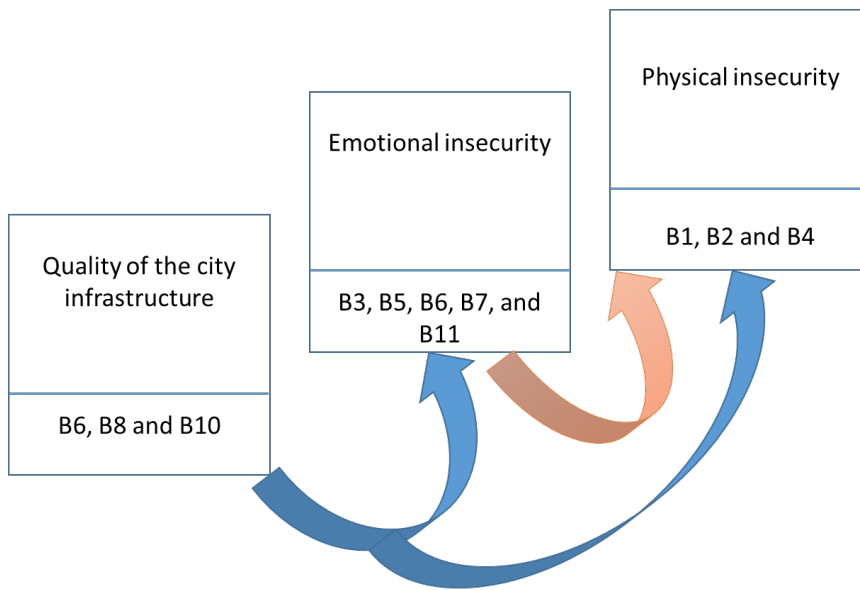
**Table 3: barriers against the development of the School Road project**

<b>Barriers</b>		<b>M</b>	<b>SD</b>	<b>n</b>
B1	Meeting adult with wrong intentions	4.1	1.2	177
B2	Feeling sick in the street	3.4	1.4	177
B3	High traffic density	3.4	1.5	177

B4	Fighting with other children	3.4	1.4	177
B5	Feeling alone. No access to any adult for help	3.3	1.4	168
B6	Crossing unsecured zones	3.2	1.4	177
B7	Entering to school too early or going out too late	3.2	1.4	177
B8	Low lighting in the street	3.1	1.5	177
B9	“Youngest son” effect	2.9	1.4	162
B10	Small or damaged pavement	2.8	1.4	177
B11	School too far from home	2.6	1.5	168

A strong analytical classification can better delineate our findings. We observed three clusters of barriers based on two grades of danger, as well as on the quality of the service. The first grade is related to physical insecurity and health threats regarding inherent barrier risks. The associated barriers are B1, B2, and B4. The second grade is linked to a more diffuse risk, an emotional insecurity and feeling that the situation in which children are involved on the school road may generate physical danger. The associated barriers are B3, B5, B6, B7, and B11. The third cluster is related to the quality of the city infrastructure, which may generate conditions for physical or emotional insecurities. The associated barriers are B6, B8, and B10. Moreover, we believe that the three clusters are linked and can be hierarchized. The quality of the city infrastructure is the most fundamental one. Accordingly, if these needs are not overcome, children cannot walk safely on the streets, with the generated insecurity being both emotional and physical. We believe, however, that emotional and physical safety needs are concomitant. We use the term “emotional” for traffic density, unsecured zones, and schools far from home, as they generate emotional behaviour. Parents fear their children may be exposed to dangerous situations even if it is not concrete. For instance, if we take “traffic density” answers, we can argue objectively that cars are on the road and that children are on separate pavement. So unsecured zones, with low affluence or the school being far from home, do not provide tangible reasons for imminent danger. To the contrary, physical insecurity deals with children’s integrity and represents the most harmful kind of danger. It usually derives from a barrier in the two precedent clusters. For instance, low street lighting makes it easier for aggression from an adult with bad intentions. In Figure 5, we demonstrate issues in the three different clusters observed and previously described.

**Figure 5: Relationships between the three barrier clusters**



## 6 Conclusion

The objective of this study was to identify and classify barriers related to the initiative on the School Road. We listed them in a preliminary qualitative study based on one-to-one meetings with different project stakeholders. We performed a quantitative analysis aimed at prioritizing the identified barriers in the first phase, according to parents' opinions. The last phase involved interviewing the principal actors of the project (the parents), which showed some limitations. Given other avenues of investigation, the authors believe project stakeholders, starting with the children themselves, and including the parents' association, school representatives, and City Hall. The corresponding results must be compared to those determined in this article. Section 5 of our study gathers different barriers in three clusters, which include physical and emotional insecurities and the city's infrastructure quality. However, according to the first part of the study (section 4), the project management quality of the School Road Initiative is a group of barriers that can be considered as a fourth cluster.

Our research constitutes the basis for further development and definition of possible solutions to mitigate the causes of identified barriers. Tax-financed municipal services are monetarily constrained and could be unable to respond to these needs (Engelke, Mauksch, Darkow, & Gracht, 2014). As a consequence, future research should investigate how urban development may move from public managers to an entrepreneurial focus, in which collaboration with private companies may provide added value. The new paradigm of Smart Cities highlights the use of information and telecommunication technologies for better efficiency of urban services in response to resident needs (Caragliu, Del Bo, & Nijkamp, 2011). Other lines of research might analyse how emerging technologies, e.g., Big Data, Social Media, and Internet of Things (IoT) could implement innovative solutions to secure the Road to School. Moreover, we surmise that owners of local and small businesses have been "overlooked" in most of these projects, but could also play a central function, similar to the role of "trustful adults" and participate in "securing" the Road to School.

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