



High school commuters. Sustainability education on students' mobility behaviours and perceptions of their everyday landscape

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Abstract

Geographic education has the ability to easily connect everyday practices and experiences to global issues and trends, linking students' everyday life with science and society and more generally allowing students to appreciate the complexity of life. Landscape and mobility provide key concepts to help students understand the relationships between society and ecosystems, especially as these notions directly relate to everyday experience. The main goal of this article is to describe the results of an experiment on sustainable mobility in which high school students were asked to make a change in their commuting behaviours: walking or cycling instead of using other means of transportation. The data collected through an online survey and the production of mental maps enabled the researcher and the students to reflect on their commuting behaviours and the perceptions of the everyday landscape in relation to mobility. This article explains the methodology and the data collected and offers some considerations on the sample analysed and on the theoretical underpinnings of the experiment.

Keywords: Cycling, Everyday Landscape, Geography Education, High School, Mental Maps, Sustainable Mobility

1. Introduction

As climate change adaptation and sustainability gain increasing attention, especially in public policies, geography can play a key role in offering knowledge, concepts and tools to promote sustainable behaviours. As the 2016 International Geographical Union (IGU-CGE, 2016) International Charter on Geography Education states, geography is a vital subject and resource as it facilitates understanding the relationships

between social behaviours and the environment and offers a powerful, critical knowledge, from a local to a global level (Van der Schee, 2016; De Vecchis, 2011, pp. 123-130; Puttilli, 2011). Despite this charter and many other official statements unfortunately, geography is frequently not considered as a core school subject. However, students are exposed to numerous stimuli every day that require geographic knowledge and skills, from online map reading to the interpretation of the continuous flow of information from all over the

world, from real and virtual mobility experience to migrations and cultural differences. A main characteristic of geographic education is the ability to easily connect such everyday practices and experiences to global issues and trends, linking students' ordinary life with science and society and more generally enabling students to appreciate the complexity of life on planet Earth. Among the many geographical concepts, landscape and mobility might provide a key to understanding the relationships between society and ecosystems, especially as these notions directly relate to everyday experience.

The landscape, according to the European Landscape Convention, is determined by people's perceptions and behaviours (Council of Europe, 2000). It belongs to everyone, and everyone belongs at least to one landscape. Landscape literacy (Spirn, 2005) is considered to be a prerequisite to promoting landscape quality and sustainability (Castiglioni, 2012), but given its ambiguity, the concept of landscape is rarely fully explored at school. As a subject, mobility, at least in the Italian educational and academic context, primarily concerns transportation means, migration and international flows of people and goods. There is a lack of attention to short-distance and everyday experiences of mobility and its effects on the environment and perceptions of the landscape.

Although highly relevant in fostering global changes, everyday practices, especially regarding mobility and landscape, demand more consideration and understanding. This need resonates with the key messages of the International Year of Global Understanding, held in 2016, which emphasised the importance of the connection between science and everyday actions (van der Schee, 2016, p. 13). Educational programmes and activities, therefore, should go beyond teaching facts and concepts and be aimed at providing students with powerful thinking instruments and engaging them in actions that motivate sustainable behaviours (idem, p. 16; Collier, 2004). The effectiveness of sustainability education, moreover, depends on the actions carried out by the whole school itself (Granados Sánchez, 2011, p. 176; Tilbury and Wortman, 2005), as will also emerge in the results of this experiment.

The main goal of this article is to describe the results of an experiment on sustainable mobility conducted with high school students. The data collected through an online survey and the production of mental maps enabled the researcher and the students to reflect on commuting behaviours and perceptions of everyday landscape in relation to mobility. The article begins by laying out a brief theoretical framework of mobility and landscape studies in research and education, focussing on whether and how research translates into tools for education and sustainability awareness. Next, a two-phase experiment conducted with high school students using an online survey and mental maps is described. Most relevant to the topic at hand, between the first and the second phase of the experiment, the students were asked to practise sustainable mobility in their own daily commute to school. Finally, the discussion turns to the students' descriptions of their usual mobility behaviours and opinions and insights into their perceptions of the everyday landscape from an analysis of the mental maps they produced after experimenting with taking different means of transportation to school (i.e. walking or biking).

2. Mobility and landscape between research and sustainability education

Academia, especially the social sciences, has seen renewed interest in mobility on all scales in what is widely called the "mobility turn" or the "new mobilities paradigm" (Sheller and Urry, 2006). Both terms refer to major changes in mobility and space theories to consider more deeply what happens to subjects, objects and spaces during the movement from point A to point B (Aldred, 2013). Mobility, on the one hand, can be considered to be an object of research, but on the other hand, it can be used as a tool, clue or sign to detect related social issues involving, for instance, power, gender, equality and poverty (Cresswell, 2010). Regarding sustainability, mobility studies can offer insights into how and to what extent new transportation modes can be implemented, the social acceptability of changes in mobility behaviours and factors that could help or hinder these movements towards climate change adaptation.

In the Italian geography curriculum in secondary education, mobility is often treated as a subtopic covering the characteristics of the different modes of transportation but it also appears when considering demography, population movements and migration across time and space.

Landscape is a core research subject in human and physical geography as it has the power to elicit many different interpretations due to the tensions that it raises between objectivity and subjectivity, observation and experience (Wylie, 2007). Influenced by phenomenological and post-representational approaches, recent landscape studies consider landscape to be the world we live in, our dwelling place, strictly related to everyday activities (Ingold, 2000). Landscape, therefore, is a component of everyday life, and its sustainability depends on a balanced, harmonious relationship between social needs, economic activity and the environment. By achieving sustainable development as its second main objective, the European Landscape Convention offers instruments and approaches to integrating landscape into spatial planning and, more interestingly for the purposes of this study, education and awareness raising. Landscape education has manifold potentials: it increases awareness of our dwelling place and our rights and responsibilities towards it as actors able to transform it. Moreover, landscape education helps build a sense of belonging, as understanding our neighbouring landscape also means understanding ourselves. Finally, it promotes the ability to read distant landscapes, thereby engaging in intercultural exchange (Castiglioni, 2012, p. 59).

It appears clear that research on both mobility and landscape can offer interpretative and operational tools to address sustainability awareness and education. More specifically, educators can borrow the phenomenological approach, which characterises both lines of research, as well as some research methodologies. As Pedroli and Van Mansvelt emphasise (2006, p. 122), the “phenomenological approach, including exercises such as sketching the landscape and telling its stories, might increase the students’ openness for the character and identity of the place”. Direct experience of landscape involves practices such as listening, smelling and looking, and what enables these experiences is the act of moving through landscape, often using a non-motorised transportation mode, such as walking or cycling. If

direct contact with landscape is of paramount importance, this experience also needs to be analysed and compared with others to draw useful insights. Geographical research methodologies can be easily applied to do so in an educational context. Specifically, the use of questionnaires and surveys helps students share their opinions and compare them with their classmates, while cartographic and other visual tools can express experiential values, emotions and sensations (Plutino and Polito, 2017).

Among cartographic tools, mental maps have gained widespread use since Lynch’s (1960) seminal research on Boston’s readability. Mental maps consist of subjective representations of spatial knowledge made of words, feeling, images and information about elements of the physical environment and their spatial relationships (Weston and Handy, 2004). Mental maps and similar tools such as sketch maps can be used to give a general description of a city from the perspective of its inhabitants. As in Lynch’s study, these tools can help deepen transportation and mobility analysis, uncover values and sensations related to places such as perceived risks and safety, assess geographical knowledge and, finally, support participation and community-building processes (Boschmann and Cubbon, 2014). In education, mental maps are applied to help students develop basic geographical and sustainability competencies (Wise and Kon, 1990; Caniglia et al., 2016), they vary according to age, sex, culture, etc. and they grow in accuracy and complexity the more students are trained in observing their surroundings, memorising landmarks or other maps and also in representing spatial information with drawings (De Vecchis, 2011, p. 104).

Before describing the use of questionnaires, mental maps and the phenomenological approach in the case study, it is necessary to stress a characteristic of the research context (Italy) which is also common in other countries (e.g., Emond and Handy, 2012, p. 71). In addition to the thematic gap that often separates academic research and education, most educational initiatives regarding sustainable mobility, such as those described in this paper, are targeted only at primary and lower secondary school students. This is seen, for example, in the number of teacher training programmes, documents on experiences and shared materials available on the

website of the Italian national cyclists' federation (Figure 1). This account, therefore, is also aimed at sharing the results, potentials and critical nodes of this experiment with high school students to foster the implementation of similar initiatives in other secondary schools.

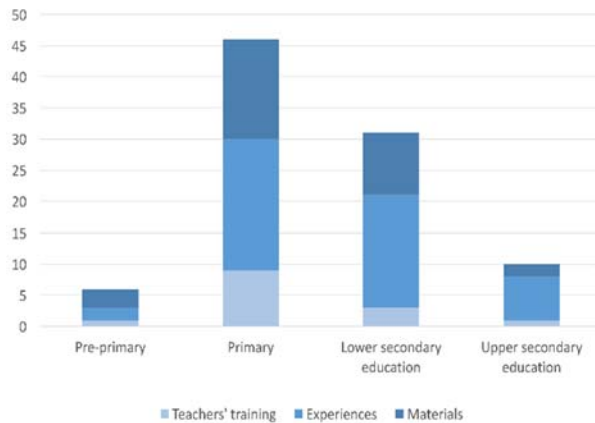


Figure 1. On-line resources on cycling education.
Source: Italian Friends of the Bicycle Federation (FIAB Onlus) official website (www.fiab-onlus.it).

3. Methodology: from critical understanding to proposed action

In March 2017 as in the past seven years, I was asked to hold a class on sustainable development as an extracurricular activity for students at the secondary school I attended, the Scientific Lyceum “Lorenzo Mascheroni” in the Italian city of Bergamo. The class comprised two 1-hour lessons with five classes of students in the fourth year of high school (16-18 years old). Every year, the aim of the class is first of all to address sustainability from a critical point of view, teaching students how and in what social and environmental circumstances the concept emerged, as well as alternative approaches, and, secondly, to share practical solutions alongside theoretical facts and concepts. Every year, the teacher responsible for this seminar has given positive feedback about the topic and the interest of students, while their actual engagement and confidence in change and sustainability remain low. As Granados Sánchez points out, although referring to the case of Spain, the adoption of participative learning methodologies can be integrated to cope with this lack of engagement skills, especially when the components of the

geographical competences for sustainable development related to taking local action in community projects are not accomplished throughout the educational stages (2011, p. 172).

The goal of this year's experiment, therefore, was to stress the tangible and everyday-life-related face of sustainability through the direct engagement and participation of students. The title of the class was “Sustainable development: from critical understanding to proposed actions” and, as the title suggests, it consisted of two phases conducted a week apart. In order to elicit knowledge and insights useful for both research and education, an “explanatory sequential” mixed method approach (Zadrozny et al., 2016 p. 221) was implemented, consisting in a quantitative phase (a survey) followed by a deeper exploration through a qualitative phase (mapping and group discussion).

In the first stage, a standard lecture focussed on global trends (e.g. population growth, uneven resources distribution, natural resources consumption, atmospheric pollution, biodiversity loss and sea level rise), their consequences for habitats and populations and the various approaches that emerged alongside sustainable development (e.g. frontier economics and the concept of de-growth). Next, the topics of mobility and the bicycle as a symbol of transport sustainability were deepened, as mobility has been considered capable of connecting students' subjective everyday experiences to the global level. Basic information about the modal split, pollution caused by different transportation means and other social, economic and political features related to the promotion of cycling were explained. After being encouraged to think globally, the students were asked to start acting locally, taking part in a basic research process through two different methodologies: an online survey and the production of mental maps.

The online survey based on the Google Form platform was open to all the students in the school and was aimed at collecting information on their mobility behaviours. In addition to basic demographic information (e.g. the participants' class, age, sex and hometown), the first section of the questionnaire was intended to capture the students' opinions on the usefulness of reducing traffic-related environmental impacts. The survey then focussed on the students' usual means of

transportation in their everyday commute to school and finally on their opinions and ideas specifically related to the use of bicycles. Similar surveys can be found in literature, mainly in the context of transport geography (e.g., Emond and Handy, 2012) or health studies (e.g., McKee et al., 2007). Emond and Handy adopt a paper-based survey to provide a better understanding of what encourages cycling among high school students while McKee et al. offer an example of a mixed-method research, although conducted with primary school children, that encompassed an online computerised questionnaire to ascertain barriers and motivation to actively commute to school.

To allow the students to develop critical, global but also personal opinions on the topic, the second research methodology required their direct involvement in putting sustainable mobility into practice. The students were asked to commute to school or to another common destination using a sustainable mode of transportation (e.g. walking or cycling) for at least one day before the second meeting. To collect their impression, sensations and thoughts, they were asked to draw a mental map of their itinerary. As previously stated, mental maps are a very useful tool for assessing perceptions. Nowadays, most of the applications of such technique use sketch maps or Geographical Information Systems in order to allow easier comparison (Manton et al., 2016; Boschmann and Cubbon, 2014). In the present study, the exercise aimed at eliciting landscape perception and experiences along different itineraries, therefore a baseline map was not needed and free-hand maps were considered the best option in order to facilitate students to freely express themselves, as in Calandra and Palma (2017), where free-hand drawings served as first step to elicit young students' mental representations of their everyday places after the 2009 earthquake in L'Aquila, Italy.

During the second lesson of the experiment, the information gathered from the survey and the students' opinions about their direct experience, mobility form chosen and landscape travelled provided the basis for the discussion. Workshops were conducted with groups of about five students each to share their opinions, identify positive and negative aspects and generate proposals to increase the number of students who

bike to school. At the end of the experiment, each group presented their opinions and proposals, which were then collected in order to be offered to the school administration.

4. Results of the on-line survey

The online survey was distributed to all the students in the school during the two weeks of the experiment and was completed by 327 students (23.4% of the school population). The sample is fairly representative of the entire school, given the high response rates from first-, second- and third-year students, along with the fourth-year students who participated directly in the experiment (Figure 2). Regarding gender and age representation, 56% of the respondents were male, similar to the general gender composition of this scientific high school, while the students' age varies from 14 to 17 years old.

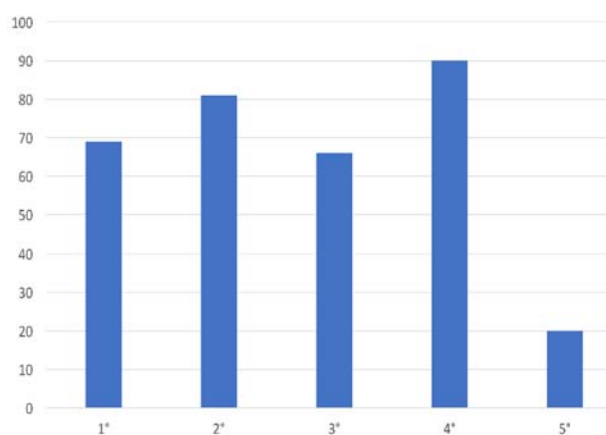


Figure 2. Distribution of the participating students per class year.

More than half of the participants come from the city of Bergamo or nearby municipalities, as shown in Figure 3. Although many students live within a 10 km radius, a distance within which bicycling is highly feasible (Staricco, 2013, p. 351), and 93.9% of students own bicycles, only 8.3% cycle to school. The majority commute to school using public transport, such as buses and trains (Figure 4), but a considerable number still are driven to school (26%) or use motorbikes (11.6%).

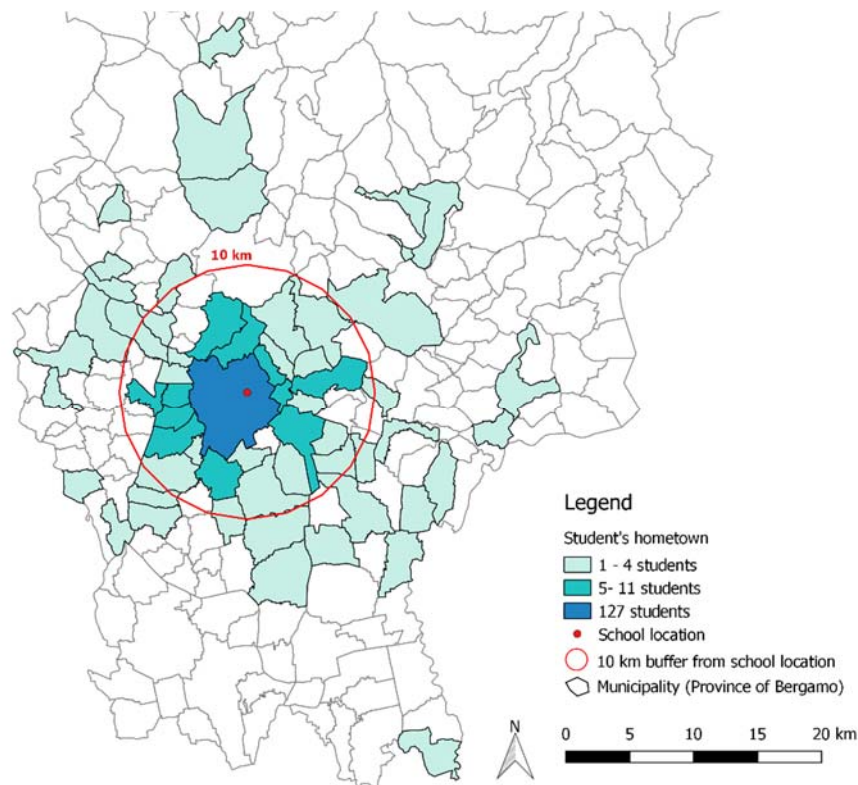


Figure 3. Distance of students' hometown from the school.

The survey then asked the students to rate on a scale of 0-10 how important they thought it was to reduce the environmental impacts caused by car traffic. The majority rated its importance at 8 (27.8%) or 10 (25.1%). Curiously enough, especially considering the distance of the students' hometowns from the school (Figure 3), 43.4% of the students considered the length of the trip to be among the three main obstacles (or concerns) that limited the use of bicycles to commute to school. The second main concern was bad weather (33.6%), followed by the effort needed (28.7%).

With regard to the students' opinions on factors that would encourage them to cycle to school more frequently (Figure 5), improved cycling infrastructure, such as bikeways and bike paths, garnered the greatest consensus (61% of participants). Improved intermodality the possibility to use different modes of transportation during one trip with trains and buses would also encourage the students to consider bicycles as an option (33.2%).

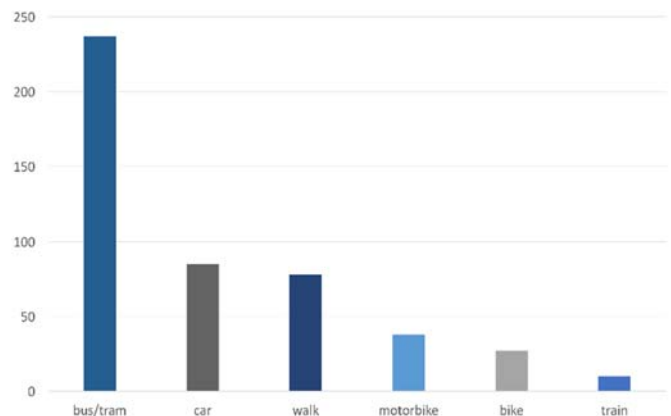


Figure 4. Means of transportation used by the students.

Intermodal options included being able to carry their bicycles onto trains or use bike-sharing services with an annual bus-ticket subscription. Students also appeared to be interested in rewards or other incentives (23.5%) and worried about the safety of their bikes when parked (16.5%).

The final question of the survey was designed to collect ideas and proposals to increase students' awareness of sustainable mobility and use of bicycles. These suggestions were listed and presented during the second part of the experiment as a starting point for group discussion.

5. Analysis of the mental maps

The second phase of data collection involved only the five classes that took part in the experiment, limiting the number of participants to 70 students. These students agreed to directly experiment with a mobility change in their routine and to walk or bike to school or another frequent destination instead of using their regular means of transportation (Figure 6). The majority of the students usually used public transportation, particularly buses, to get to school, and this group was equally split between those who chose to experiment by biking and by walking. The same distribution was found in the motorbike group, while those who usually took cars to school preferred to bike. Those who usually took cars to school preferred to bike.

Most of the students (50 out of 70) decided to experiment by walking or biking to a destination other than school, such as the supermarket, the gym or a friend's house. Thus, only 20 students truly experimented with changing their commuting behaviour, and most of these students decided to walk (12). Nevertheless, the exercise made it possible to collect a useful set of mental maps with drawings, indications, landmarks, points of references and comments about the paths students took (39 bicycling and 31 walking).

Along with drawing the itinerary taken, the students could also explain their positive and negative impressions of the experience (Figure 7). Analysis of these comments showed that contact with nature and the landscape was the primary positive aspect, especially among those who biked. Exercise and relaxation were the two other positive impacts reported by the students, both those who biked and those who walked. Those who chose to bike also described speed, fun, a feeling of independence and interaction with nature as positive aspects.

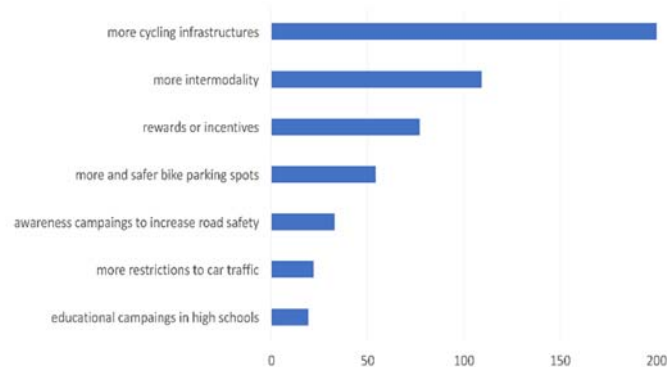


Figure 5. Motivating factors for the students to cycle more to school.

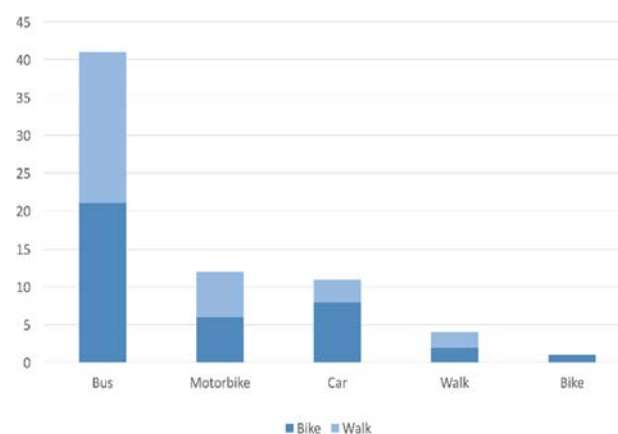


Figure 6. Students who decided to walk or bike by their regular means of transportation.

Both biking and walking but especially the latter allowed students to observe their surroundings, which they considered to be a positive outcome of the experience. The main disadvantages of both walking and biking were the fatigue and the physical effort (which could be regarded as positive if viewed as exercise) and the longer time taken to reach the destination. Traffic, pollution, cold and bad weather and perceived danger, particularly due to the lack of bikeways, were considered to be disadvantages, especially for those who biked.

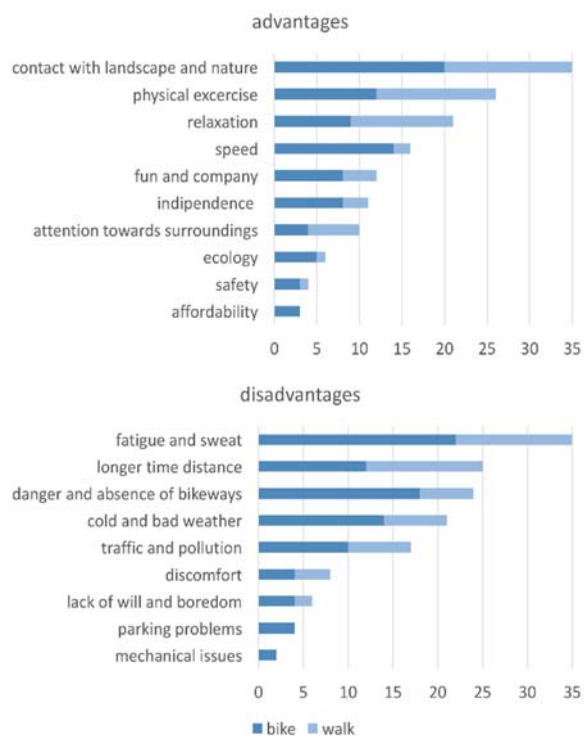


Figure 7. Advantages and disadvantages of biking and walking.

In addition to these comments, which gave an interesting overview of the students' opinions, the experiment had the students produce mental maps as an exercise to reflect on the path taken and the landscape elements encountered along the way. The representation of the nature and number of elements in the students' mental maps was analysed to evaluate the students' ability to read and represent the landscape and the influence of the means of transportation on their perceptions of the landscape.

The maps could be divided into at least four categories from the most basic to the most complex, according to the type of elements included: lines, landmarks, landscape elements or comments. This categorization is drawn from the analysis of the maps but, even though simpler, it is also consistent with the one used by Murray and Spencer (1979, p. 387) which identified different degrees of organization, elaboration of features and complexity of mental maps.

Lines representing roads form the skeleton of

the map drawings and sometimes lines and paths, along with labels, were the only components of the most basic maps (Figure 8).

The second category includes all the maps with icons and drawings with labels – or legends in some cases – representing landmarks (Figure 9). This category and the first were the largest as most of the maps had only lines that connected points of reference.

Other drawings representing landscape elements appeared in only a few maps, mostly the river and some urban green areas, such as parks and areas with trees, hills and mountains in the background (Figure 10).

Finally, some maps were enriched with comments related to the students' experiences (Figure 11). For example, one student wrote “new road discovered” on a map, others pointed out uphill roads that required more energy while biking or walking, and some added comments on encounters or events along the road, such as the rabbit in the left map in Figure 11. The majority indicated where and why the road was dangerous. Thus, the maps contributed to restoring a more complex image of the journey through the students' everyday landscape comprised of both the elements (a few natural, most artificial) and interactions with them.

Deepening the analysis, the landmarks could also be divided by the category of elements they represented. In the mental maps drawn by the students, landmarks mostly consisted of shops, public services (e.g. schools or churches) and some public spaces (squares or parks).

Most of the maps represented only the paths taken by the students, with no indication of parallel or intersecting roads. These mental maps often appeared childish for the students' age (17-19 years old), and this could reflect lack of training or use of their ability to interpret their surrounding landscape, orient themselves in it and then represent it in maps. The students' geographic skills, therefore, could be strengthened, for example through observation, memorisation and representation activities that encompass innovative teaching strategies as well as the use of classical and digital cartography.

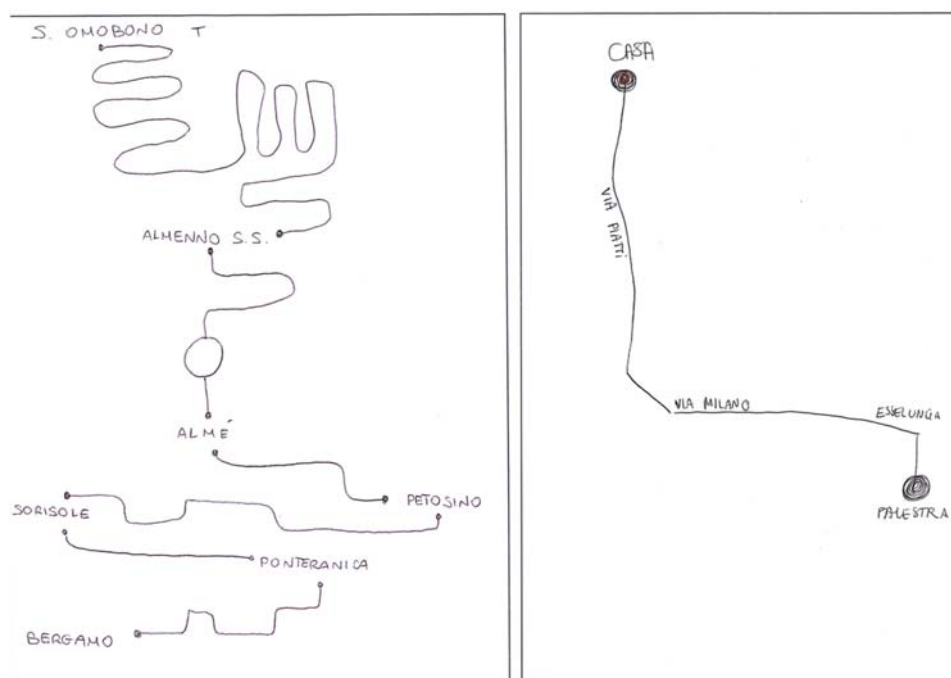


Figure 8. Mental maps with lines.

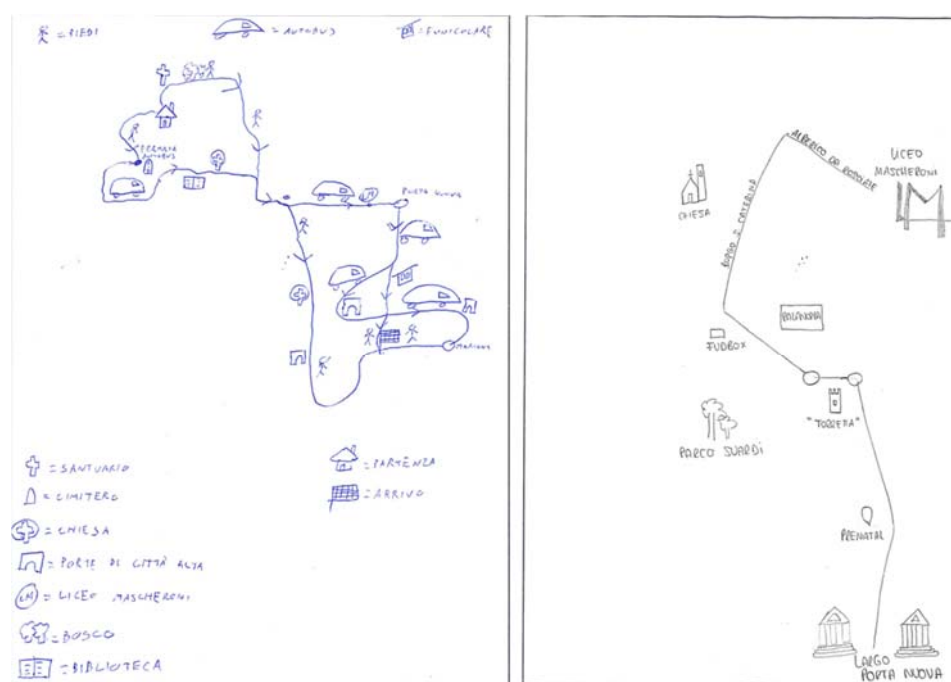


Figure 9. Mental maps with lines and icons.

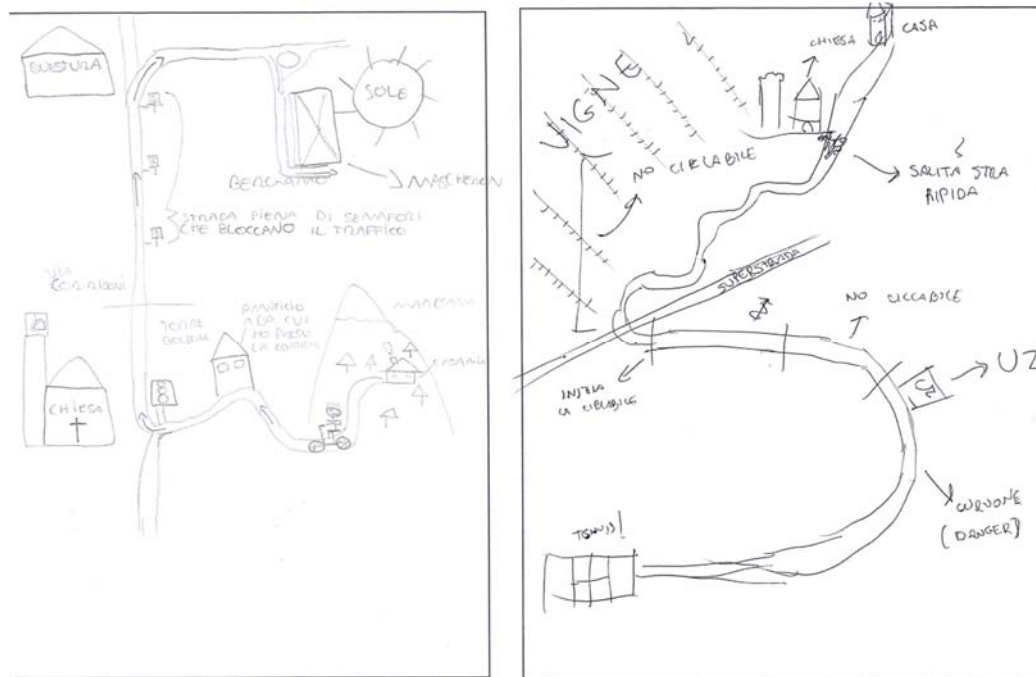


Figure 10. Mental maps with drawings.

Another interesting insight could be drawn from comparing the mental maps of the students who biked and walked. Among those who cycled, 12 out of 39 (30%) added comments about their experiences (e.g. traffic, uphill stretches or stops) to their maps, while only 5 out of the 31 (16%) who walked did the same. Although these numbers cannot be considered statistically significant or support any generalisable conclusions, it can be stated that at least in this experiment, cycling appeared to be better able to involve students and elicit more comments and reflections.

6. Results of the group discussion on proposals

The result of the online survey, the students' comments and their list of positive and negative aspects of biking and walking as means of sustainable transportation served as the basis of the discussion during the second phase of the experiment. As described, the class was divided into smaller discussion groups which had a defined amount of time (10-15 minutes) to internally negotiate a common opinion on the primary pros and cons of non-motorised forms of mobility and, more interestingly, to develop a

concrete proposal for action to increase the number of high school students commuting by bike. The result of this group work in the experiment was a unique list of proposals based on data related to the entire school collected through the online survey, the subjective, direct experience of sustainable mobility put in practice and, finally, the discussion and negotiation phase.

The ideas on this list concerned infrastructure, incentives and participation solutions. Students asked for safer roads with more bikeways, bike lanes and slow traffic areas but also realised that bikeways needed to be more visible and have adequate signals. They believed that more secure bike parking, showers and lockers at the school might make a difference. Along with road and infrastructure solutions, which were essential but primarily the responsibility of municipalities, the students proposed various bicycling incentives schemes: food and beverage discounts or vouchers in the school cafeteria using a mobile monitoring mechanism via app that awards points for each kilometre pedalled; generic rewards or coupons for stores; discounts on the annual subscription fee for the bike-sharing system; and sponsorship of the purchase of bicycles or electric bikes by local companies.

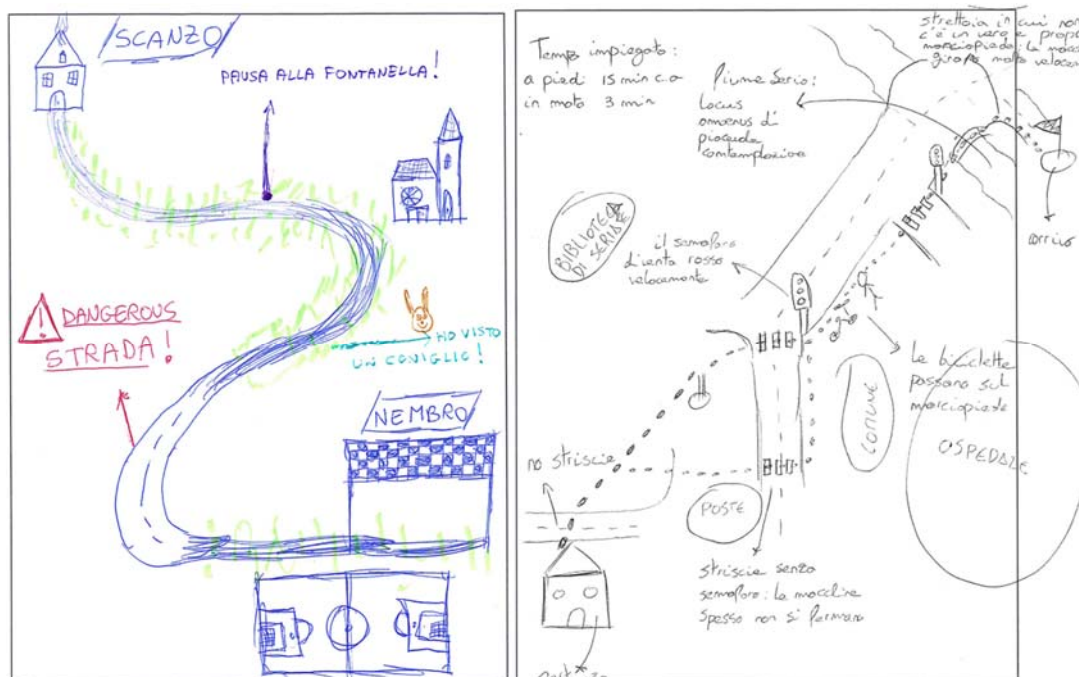


Figure 11. Mental maps with comments related to the experience.

The last groups of ideas related to high school students' participation and involvement in discovering the bicycle not only as a means of transportation but also as a sport that could improve physical and psychological wellbeing. According to the students, this could be encouraged in general by educational and awareness campaigns but, more specifically, by the establishment of official school bike days inviting students, teachers and employees to bike to school; charity bike rides or competitions between classes and schools; and, finally, bicycle mechanics challenges. Most of these proposals confirm the need of what has been called the "whole school approach" (Tilbury and Wortman, 2005) as a set of coordinated strategies and actions towards sustainability taken at the level of the school management and beyond (such as the municipal, regional or national level).

7. Conclusions

The efficacy of sustainability education depends on students' direct, active involvement and their understanding that sustainability is relevant to and affects their everyday life (Collier, 2004; Pedrolì and Van Mansvelt, 2006; van der Schee, 2016). In Italy, sustainability and

environmental education is mainly directed at primary and lower-secondary pupils rather than high schoolers, who nevertheless are thought to be more independent and capable of making changes in their day-to-day routine. The experiment described in this paper directly addressed mobility issues and implicitly everyday landscape perceptions among five classes of students at a scientific secondary school in Bergamo, Italy. Scholars focusing on practices and experiences have increasingly explored both mobility and landscape notions; therefore, they can function as key concepts linking sustainability with students' everyday life, as indicated by the interest and the number of the participants in the online survey, which extended beyond the five classes involved in the experiment.

The overall goal of the experiment was to test a methodology that could stress the tangible aspect of sustainability, its relation to day-to-day practices, such as commuting, as well as its connection to our ability to read and to connect with our everyday landscapes. Borrowing Collier's words, it focuses on "promoting the doing" rather than knowing (2004, p. 22) and on "promoting connection to place messages" (ivi, p. 23). The survey, the production of mental maps

and the group discussion on students' direct experiences made it possible to draw some insights regarding student's commuting habits, their relation to landscape perception and, finally, on the efficacy of this methodology of awareness raising and sustainability education.

According to the survey, most high schoolers commuted to school by bus, followed by the car as the second most used means of transportation. Although the majority of the students lived within a 10 km radius of the school, only a few brave students considered bicycling as an option. The low participation in the mental maps compared to the high participation with the online survey might signal not only that the methodology could be improved but also that students found it very difficult to make changes in their habits, even if only for one day. In particular, only 20 of the 70 students who completed the mental map walked or biked to school instead of another common destination (which was the second option). As Emond and Handy report (2012, p. 77), perceived distance is often an important deterrent to bicycling. Research both in geography and sustainability education could therefore focus more on factors and conditions related to distance perception, in order to evaluate whether and how it is possible to increase students' willingness to change their behaviours towards sustainability.

Regarding landscape perceptions, the students most commonly identified the "open air", "direct contact with nature" and the possibility to "observe the landscape surrounding you" as the most positive aspects of their walking and biking experience. Nevertheless, the mental maps showed a higher prevalence of urban and anthropic landscape elements (e.g. roads, roundabouts, squares and buildings) over natural ones, which were rarely represented (e.g., rivers, hills, trees and urban green areas). The landmarks and points of references in the maps corresponded mostly to commercial activities. This lack of representation of some landscape features suggests a physical and cognitive distance between the students and what they consider to be the natural landscape. Moreover, the scarcity of details found in many mental maps might arise from the fact that most students were driven to school and did not play an active role in choosing the itinerary and orienting themselves. These two hypotheses could be the subject of further

investigation on the relationships among students' mobility practices, space awareness and landscape literacy. A similar use of mental maps as a basic exercise to unveil different landscape understandings and perceptions could also be replicated as a tool to teach students to think geographically through the exploration of the local landscape (Hermann, 1996).

In addition to the sustainability of students' commuting habits and their ability to read and represent the landscape, the experiment produced positive results regarding awareness. The students were prompted to reflect on their own commuting behaviours and to experiment with different transportation or at least to discuss the experience with students who did the experiment. The success of the experiment could also be further analysed with the same sample of students to perform an ex-post analysis on eventual changes to commuting behaviours.

In conclusion, this experiment demonstrated that geographic education has potential, particularly to address and simultaneously involve different concepts and skills, such as sustainability, mobility, urban planning, participation, landscape literacy and mapping. The concepts of landscape and mobility, especially, make it possible to undertake sustainability education activities which are closely correlated to everyday practices, although there is the need to deepen the analysis on what could encourage a more proactive attitude among students. Moreover, since the literature on sustainability – and specifically on sustainable mobility – education geared towards secondary school students is limited, the description of the activities here presented might serve as a basis to reproduce, improve and compare other experiments in similar contexts, making it possible to gradually fill the existing gaps both in didactic and research contexts.

Acknowledgements

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