How does socio-economic status affect the use of CRS and seat belts? Preliminary results from a study in Athens

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Abstract

Socioeconomic status (SES) seems to have a clear relation to several health issues, with traffic injury risk being one of them. The aim of this study is to examine the link between SES and the use of restraint systems for young children and the adults accompanying them, on their everyday commute, to the nursery school.

The study is based on a statistical analysis of data, from 734 children, collected from municipal nursery schools, in three suburbs of Athens: (i) Fyli (low SES area), (ii) Ilioupoli (medium SES area) and (iii) Kifissia (high SES area).

Although 90% of children are driven to school a large percentage of respondents specify that they do not use CRS systematically (26%), or driver seatbelt (9%) for this commute. Logistic regression model results show that the use of driver seat belt and CRS are influenced by SES of the family and the SES of the area.

Keywords: *Road safety, socioeconomic status, child restraint system, seat belts, pre-schoolers*

Περίληψη

Υπάρχουν πολλά ζητήματα υγείας για τα οποία φαίνεται να υπάρχει μια σαφής σχέση με το κοινωνικοοικονομικό επίπεδο (ΚΟΕ). Η επικινδυνότητα τραυματισμού από τροχαίο να είναι ένα από αυτά. Ο σκοπός αυτής της μελέτης είναι να ερευνήσει την σχέση μεταξύ κοινωνικοοικονομικού επιπέδου και την χρήση ειδικών συστημάτων συγκράτησης από μικρά παιδιά και τους ενήλικες συνοδούς τους, κατά την καθημερινή τους μετακίνηση στον παιδικό σταθμό.

Η μελέτη αυτή βασίζεται στην στατιστική ανάλυση δεδομένων, 734 παιδιών, που συλλέχτηκαν, από τους δημοτικούς παιδικούς σταθμούς, τριών προαστίων της Αθήνας: (i) Κηφισιά (περιοχή υψηλού ΚΟΕ), (ii) Ηλιούπολη (μεσαίο ΚΟΕ) και Φυλή (χαμηλό ΚΟΕ).

Παρότι το 90% των παιδιών πάνε στο σχολείο με Ι.Χ, σε ένα μεγάλο ποσοστό απαντήσεων δηλώνεται ότι δεν χρησιμοποιείται ειδικό σύστημα συγκράτησης παιδιού (26%), ή ζώνη ασφαλείας οδηγού (9%) για αυτή την μετακίνηση. Αποτελέσματα μοντέλου λογιστικής παλινδρόμησης καταδεικνύουν ότι, η χρήση ειδικού συστήματος συγκράτησης παιδιού και ζώνης ασφαλείας οδηγού, επηρεάζονται από το ΚΟΕ της οικογένειας και της περιοχής.

Λέξεις κλειδιά: *Οδική ασφάλεια, κοινωνικοοικονομικό επίπεδο, ειδικό σύστημα συγκράτησης παιδιού, ζώνης ασφαλείας, παιδιά προσχολικής ηλικίας*

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1. Introduction

Socio-economic status is used in the social sciences to describe an individual or a household economic and social position relative to the rest of the society. Socio-economic status seems to have a clear relation to several health issues, with traffic injury risk being one of them. There is substantial literature on socio-economic inequalities in traffic injury rates of children worldwide (Laflamme and Diderichsen, 2000), but also to the overall commuting patterns of children (Timperio et al., 2006). In a study conducted in Athens, Greece, Moustaki et al. (2001), investigating whether socio-economic status of town of residence is associated with risk for childhood pedestrian injuries, concluded that there is a considerable social gradient for childhood injuries irrespective of place of accidents. SES can be evaluated using one or all three of the following variables, income, education, and occupation.

It is well known that in urban areas the population can be heterogeneous in terms of social and economic conditions and these characteristics can change especially in times of financial crisis. Also there is an interaction between an individual's behaviour and the geo-social neighbourhood.

Consequently in order to understand the effect of SES on traffic injury risk of young children, it is useful to examine the SES of the family both in relation to the SES of the area of residence as well as separately. This seems to be reasonable as there are environmental risk factors prevailing in areas of differentiated SES but also expressions of behaviour linked to individual's SES, as well as the SES of the area.

The aim of this study is to examine the use of CRS and driver seat belt, in three suburbs of Athens, in relation to SES. To do so we specifically examine the everyday commute of young families with pre-school children to the nursery school.

The remainder of this paper is structured as follows. The next section gives a detailed background of the SES diversity in areas and families. Then the methodology used is described, as well as the questionnaire design and the study area selection. Following this, results are drawn from the collected data. Finally, the findings of the study are discussed, along with suggestions and further study recommendations.

2. Background

2.1 SES - of area, neighbourhood differentiation

There is an international interest in understanding the link between health implications and the neighbourhood environment (Van Loon et al., 2014). This interest reveals the increased appreciation of the interaction between individuals and their environment both built and

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social. Several outcomes are associated empirically and are predicted by similar structural characteristics. Neighbourhood effect is part of a long sociological research on urban communities. Research on neighbourhood effect examines the social processes or mechanisms as related to problem behaviours and health related outcomes (Sampson et al., 2002). A neighbourhood is a part of a larger community and their compositional characteristics are not static but change and develop just as individuals do (Sampson et al., 2002). In times of financial growth or crisis this is more apparent. In Athens Greece before the financial crisis there was a tendency for young middle class families to relocate to higher class suburbs on one hand and large numbers of immigrants residing in the low SES suburbs. In the times of crisis young families tend to move to more affordable neighbourhoods.

2.2 SES –families

Behaviours and attitudes of children are often subject to parenting styles and family structure. Safe driving belongs to the list of adolescent behaviours influenced positively by authoritative parenting (Ginsburg et al., 2009). Literature, on parenting styles, suggests that the effects of socioeconomic status on parenting are profound and pervasive; there are also indications that the positive associations of authoritative parenting surpass ethnicity, SES, and family structure (Steinberg, 1991). Also, Dunbar et al., 2002, aiming to identify types of effective interactions between parents and children, revealed that younger children and girls showed greater dependence to their parents, while boys showed greater recklessness. Moreover, more educated parents had better control of their children. At the same time, Agran et al., 1998 showed that family and cultural variables were associated with an increased risk of injury. Particularly household crowding, one or more family moves within the past year, poverty, and inability of mother or father to read well.

2.3 SES - school –school travel

Social segregation is apparent in areas as well as schools (Burgess et al., 2005). In a similar way, municipality nursery schools in Greece have restrictions which lead to the segregation of the children attending them. First there is a clear priority to the residents of the municipality and second a clear priority to families with low earnings or specific social conditions (i.e. single parent families, unemployed parents etc.). This leads to the fact, that in most cases, families whose children attend the municipality nursery schools are of low and medium SES and leave in the municipality the nursery school belongs. In times of financial crisis in Greece, more children from medium class families request to attend the municipality nursery schools. As a consequence we have a large number of families, of highly educated parents with low earnings attending these nursery schools.

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As far as the school travel is concerned, pre-schoolers are completely dependent on their caregivers. Pre-schoolers are infants and toddlers younger than five years of age. In order to address the factors influencing pre-school travel behaviour, it is valuable to know the specific conditions that influence parents' choices. Research on this topic has identified several environmental (i.e. distance to school) and personal factors (Sirard and Slater, 2008, Yu and Zhu, 2015). There is also evidence of a longitudinal relationship between physical and social environments and walking behaviours amongst mothers (Cleland et al., 2008). Other studies show that in cases where distance to school is short, attitudes and psychosocial parameters might influence these decisions more than the built environment characteristics (Zuniga, 2012).

2.4 Synthesis and discussion

As mentioned in the introduction, this study aims to identify the mechanisms which link the socio-economic status, with the use of restraint systems, for young families. Several studies approach aspects of this study, but only a few focus particularly on safety practices, involving pre-school children. In addition, these studies have been prepared in other countries and the transferability of findings can be difficult, mainly due to transport environment and cultural differences. Traffic environment dissimilarities include poor parking facilities and poor road and sign conditions. Cultural differences include aberrant behaviour on the roads (Kontogiannis et al., 2002) but also concepts and perceptions of parenting styles (Keller et al., 2003 and Antonopoulos et al., 2012) and family structure (Triandis, 2002).

In this study we define the SES of the area of residence using as indicators the educational level the occupation of the residents and the property price zone. We focus on three suburbs of Athens with eminent differences on SES. A low SES suburb (Fyli) a middle one (Ilioupoli) and a high SES suburb (Kifissia). Using the price zones we define low, middle and high SES areas within the suburbs as well. The SES of the family is defined using as indicators, the level of education of both parents, the annual income and the family structure.

3. Methodology

A questionnaire was developed and administered to a sample of pre-schoolers' parents living in three suburbs of Athens Greece. Three key elements are examined: (a) the child transport practices, the obstacles parents face and their preferences, (b) the child-parent interaction when commuting together, and (c) the parent's perceived danger compared to the actual level of exposure to danger of the child during their journey.

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3.1. Questionnaire design

The questionnaire was developed with one starting section, collecting information about the child demographics, specifically number of children attending the particular school, their gender and age, followed by three discrete sections of questions:

1. Travelling to and from nursery school;

2. Child-parent interaction and traffic safety; and

3. Parent demographics.

Parents were requested to answer all questions. In Section 2 of the questionnaire there was a column referring to the journey towards school and another one referring to the journey from school. If there were no differences on those two journeys, they could fill only one of the two columns. The questionnaire was piloted with three parents for assessment of clarity, and took approximately 10 minutes to complete. Therefore, no issues existed and it was suitable for distribution, in terms of its length and effort required for completion.

Each local authority gave approval for distribution of the questionnaires. Afterward, the principal of each nursery school was contacted by an experienced researcher (in this case the first author of this paper). The researcher clarified the aims of this study and the procedure that would be followed. After completion of the study, a brief presentation could be given by the researcher to the parents and teachers of the schools, if they expressed an interest. The findings of the study and some general traffic safety guidelines, concerning children, would be presented.

The teachers of the schools provided all parents with a package, which included an invitation letter, the questionnaire and an envelope. Teachers informed the parents that the participation is voluntary and that all data would be given anonymously and the answered questionnaires would be sealed in the envelopes. The number of packages prepared was equal to the number of children attending the municipality nursery schools.

3.2 Recruitment and participation rate

All municipality nursery schools in Fyli, Ilioupoli and Kifissia participated in this survey. The study was undertaken with no financial incentive. The distribution and collection of the questionnaires took place during 2014. We received replies for 734 children attending the nursery schools.

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3.3 Study areas selection

Municipalities of Fyli and Kifissia were formed at the 2011 local government reform by the merger of 3 former municipalities each that became municipal units. Municipality of Kifissia is the merger of Kifissia, Nea Erythraia and Ekali and municipality of Fyli the merger of Fyli, Ano Liosia and Zefyri. Fyli, Ilioupoli, Fyli and Kifissia are suburban municipalities of Athens. Fyli lies in the west, Ilioupoli in the south-eastern part and Kifissia in the north of the Athens metropolitan area. In Figure 1 we can see the occupational structure of Athens which remains the same nowadays (Arapoglou and Sayas 2009). Fyli belongs to the working class suburbs, Ilioupoli is a socially mixed main urban area surrounded by clerical, sales and service workers areas and the municipality of Kifissia has a socially mixed area as well as professional occupations area as well as managerial and top level occupations area. These locations were chosen as they have socioeconomic and built environment characteristics of a typical low, medium, and high SES suburb of Athens respectively. In terms of properties values the price zone for Fyli spans between 650 and 800 euros/m2, for Ilioupoli, it is 1400 to 1900 and Kifissia is 1250 to 4000. In terms of educational level we take into consideration the percentage of residents over 19 years of age, with tertiary education. For Fyli this percentage is 11.05%, for Ilioupoli it is 28.83% and for Kifissia it is 48.27%.
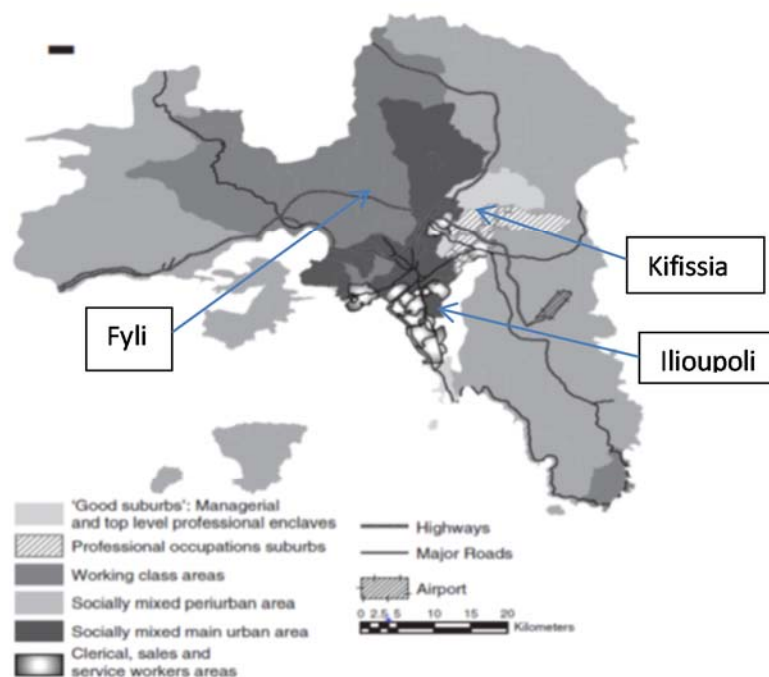

Figure 1. Occupational structure of Athens (Arapoglou and Sayas, 2009)

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4. Results

In total, responses about 734 children were considered eligible for analysis, and have been used as the basis for all subsequent results and analysis.

4.1. Parent demographics

A summary of the participant's demographic characteristics is presented in Table 1. Most participants are aged between 26 and 45, the most popular family size is 4 persons and most common annual household income is the range up to 25.000 Euros. The age and gender of children, parents are referring to, are shown in Table 2. Although in all locations municipality nursery schools accept children as young as 9 months old, the vast majority of children attending the nursery school is between 3 and 5 years old.

TABLE 1. Demographic data of respondents and general population census data

Demographic characteristics		Current sample Fyli	Current sample Ilioupoli	Current sample Kifissia	Fyli (census* 2011)	Ilioupoli (census* 2011)	Kifissia(census* 2011)	Greece (census* 2011)
Gender	Female	77%	80%	73%	50%	53%	53%	49%
	Male	23%	20%	27%	50%	47%	47%	51%
Age group*		3% *18-25 years*	2% *18-25 years*	0% *18-25 years*	14% *20-29 years*	11% *20-29 years*	10% *20-29 years*	12% *20-29 years*
		48% *26-35 years*	43% *26-35 years*	35% *26-35 years*	17% *30-39 years*	16% *30-39 years*	15% *30-39 years*	15% *30-39 years*
		43% *36-45 years*	49% *36-45 years*	57% *36-45 years*	15% *40-49 years*	16% *40-49 years*	16% *40-49 years*	15% *40-49 years*
		2% *46 -55 years*	5% *46 -55 years*	5% *46 -55 years*	11% *50-59 years*	13% *50-59 years*	14% *50-59 years*	13% *50-59 years*
		0% *56-65 years*	1% *56-65 years*	0% *56-65 years*	8% *60-69 years*	10% *60-69 years*	12% *60-69 years*	10% *60-69 years*
Marital status	Married	97%	93%	89%	48%	49%	51%	50%
	Single	1%	3%	1%	44%	40%	51%	39%
	Divorced	2%	3%	7%	2.8%	4%	4%	3%
Household income	<10.000 euro	20%	15%	12%	N/A	Average: 23.889 euro (2010)	N/A	Average: 20.202 euro (2010)
	10.000-15000 Euro	20%	17%	13%				
	15.000-25.000 Euro	28%	36%	22%				
	25.000-50.000 Euro	15%	19%	30%				
	>50.000 Euro	1%	13%	12%				
Highest level of education	Tertiary education mother	30%	46%	67%	11% (of persons over 19)	29% (of persons over 19)	48% (of persons over 19)	21% (of persons over 19)
	Tertiary education father	16%	32%	66%				
Number of persons per household	2	2%	3%	4%	3,18 persons (average)	2,45 persons (average)	2,61 persons (average)	2,55 persons (average)
	3	23%	22%	26%				
	4	46%	53%	53%				
	5 +	25%	19%	14%				

Note: * Hellenic Statistical Authority (Statistics.gr), ** Age ranges provided in italics, as they vary across data-sets, N/A: not available

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TABLE 2. Demographic characteristics of respondents' children

	Fyli		Ilioupoli		Kifissia	
Gender	Female	51%	Female	45%	Female	44%
	Male	49%	Male	54%	Male	56%
Age group (years)	1-2	1%	1-2	4%	1-2	0%
	2-3	2%	2-3	12%	2-3	12%
	3-4	38%	3-4	27%	3-4	39%
	4-5	59%	4-5	38%	4-5	47%
	5+	0%	5+	14%	5+	0%

4.2. Child restraint system use, seat belt use

The collected data suggest that 90% of the children in this study were escorted by car to the nursery school. As the only safe way of escorting a pre-schooler is using a child restraint system, we evaluate the results against this response. Most parents responded that they use child car seats; however not always. A small percentage of them are always using child restraint systems for their everyday trip to the nursery school. In addition, these drivers were not using seat belt for themselves.

It is noted that a data collection issues hampered the analysis of the data and required some manipulation. In particular, although we specifically asked parents to mention how often they use restraint system for their child in a five-level scale of "never" to "always", a number of respondents indicated with a checkmark that they did use it; however, this response does not indicate how often they use it. In order to obtain a homogeneous and consistent sample that could be used for subsequent data analysis, we decided to recode the data so that they take the value (i) 1 for those who either responded with a checkmark or responded with the top two responses in the five-level scale ("often" and "always"), and (ii) 0 otherwise.

Table 3 shows results of logistic regression model, the odds ratios (95th% confidence intervals, CI) for use of CRS and driver seatbelt in relation to SES of area. The odds ratios (95th%, CI) of use of CRS and driver seatbelt in relation to SES of area can be seen in Table 4. The odds ratios (95th% CI) in relation to each other and characteristics of the person accompanying the child can be seen in table 5. Figure 2, shows some means charts comparing the three different areas. Town 1 is Fyli, Town 2 is Ilioupoli and Town 3 is Kifissia. The use of car is above 84%, the mean distance travelled to nursery school is above 1km. As far as the tertiary education of the parents is concerned, the charts show that in Fyli and Ilioupoli mothers seem to have significantly higher level of education than fathers. In the case of Kifissia fathers seem to have slightly higher level of education. The vast majority of children are accompanied by their parent. The mean of family income spans between 2.5 and 3.3. An income of level 2 is 10000 - 15000 euros, an income of level 3 is 15000 -25000 euros and income of level 4 is 25000-50000 euros.

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As far as the SES of the family is concerned, this statistical analysis showed no significant difference in CRS use, associated with low family income. The main determinant, from the considered indicators, is the parents' level of education. As far as the SES of the area is concerned there was significant difference in the use of CRS between low, medium and high SES areas. In all areas CRS use was linked with driver seat belt use and whether the driver was the parent of the child.

TABLE 3. Odds Ratios (OR) use of driver seat belt and CRS in relation to SES of area

(a) Use of driver seat belt in Fyli vs Ilioupoli vs Kifissia

	OR	95th% CI	P
Ilioupoli vs Fyli	2.318	1.173 to 4.580	0.016
Kifissia vs Fyli	2.659	1.348 to 5.244	0.005
Kifissia vs Ilioupoli	1.153	0.550 to 2.419	0.706

(b) Use of CRS in Fyli vs Ilioupoli vs Kifissia

	OR	95th% CI	P
Ilioupoli vs Fyli	1.849	1.211 to 2.823	0.004
Kifissia vs Fyli	3.281	2.071 to 5.198	<0.0001
Kifissia vs Ilioupoli	1.785	1.151 to 2.767	0.010

TABLE 4. Odds Ratios (OR) use of driver seat belt and CRS in relation to SES of family

(a) Use of driver seat belt in relation to parent's tertiary education, all areas

	OR	95th% CI	P
Mother Tertiary Education	1.503	0.841 to 2.687	0.169
Father Tertiary Education	1.843	0.926 to 3.665	0.081

(b) Use of CRS in relation to parent's tertiary education all areas

	OR	95th% CI	P
Mother Tertiary Education	1.761	1.219 to 2.542	0.003
Father Tertiary Education	1.982	1.312 to 2.995	0.001

(c) Use of driver seat belt and CRS in relation to family's income<10000, all areas

	OR	95th% CI	P
Driver seat belt	0.674	0.312 to 1.457	0.316
CRS	0.750	0.459 to 1.225	0.250

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TABLE 5. Odds Ratios (OR) use of driver seat belt and CRS in relation to each other and care giver

(a) Use of CRS in relation to use of driver seat belt all areas

	OR	95th% CI	P
Use of driver seat belt vs no use	9.332	5.022 to 17.339	<0.0001

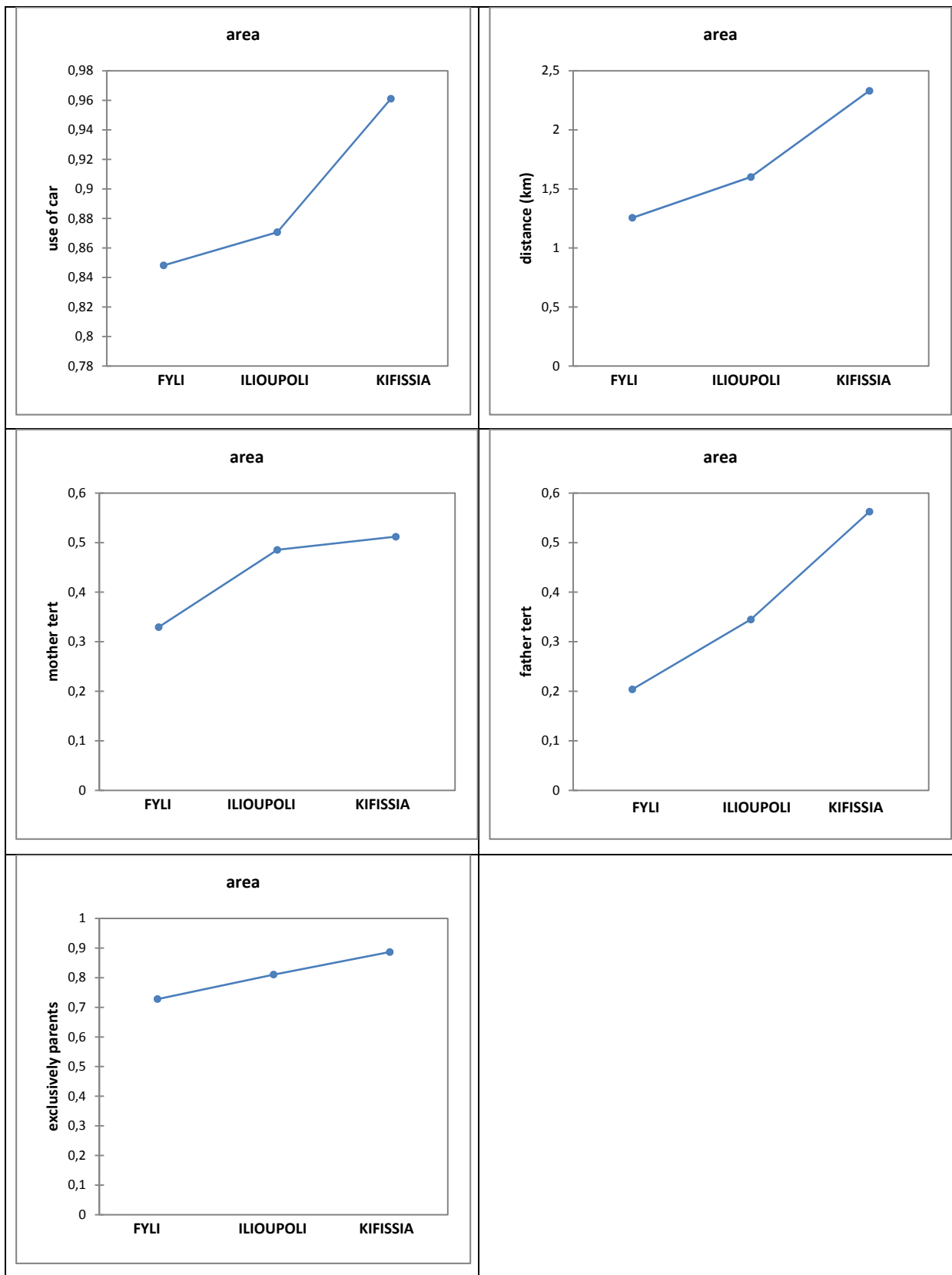(b) Use of CRS in relation to person accompanying child all areas

	OR	95th% CI	P
Exclusively parents	1.861	1.213 to 2.856	0.004
Exclusively woman driver vs exclusively man driver	1.367	0.899 to 2.078	0.144
Both gender driver vs exclusively man driver	1.111	0.691 to 1.788	0.664

(c) Use of driver seat belt in relation to person accompanying child, all areas

	OR	95th% CI	P
Exclusively parents	1.927	1.021 to 3.639	0.043
Exclusively woman driver vs exclusively man driver	1.839	0.942 to 3.589	0.074
Both gender driver vs exclusively man driver	1.109	0.543 to 2.264	0.777

Figure 2. Means charts town comparison

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5. Discussion

5.1 Main findings

Findings of this study show a very low seat belt and child restraint system use for the everyday travel to nursery school. There are several reasons for these results.

Firstly, parents are not well informed about the correct use of the restraint systems and the lifesaving effects of their use. Children might sometimes experience discomfort in the car seat and parents prefer to let them unrestrained than argue with them. Besides most children in our study are over 3 years old and younger than 5 which is the age that children could (considering their size) graduate to booster seat. Instead, parents stop using CRS altogether. Parents might be using restraint systems for their child but not for nursery school travel. Children arriving at school are less likely to be restrained than those observed at intersections (Emery and Faries, 2008)

The child restraint use law is in place in Greece since 1997, but -due to the fact that there is no strict enforcement- it is quite common for parents not to use restraint systems, especially for short distances. Another reason for parents not using restraint systems is that there are no road safety cameras or other means of law enforcement in place in the suburb. Practically the compliance with the restraint system law is left to parents' beliefs alone.

5.2 Limitations of this research

In surveys of this kind is that participants are more likely to be: female, married, more likely to have higher annual income (Koppel et al., 2013). Also, there are differences between self–reported data and observational data, as demonstrated e.g. by Lennon (2012) regarding CRS use. Participants potentially report what they believe to be the most socially appropriate response (Lam, 2000). To overcome this limitation we kept the anonymity of the participants, but we suggest that future research should validate self-reported information with observations. It is also probable that self-selection bias in the study is likely to have resulted in overrepresentation of more compliant parents (Lennon, 2012). This study has not examined whether or not the CRS in use, is appropriate for a child's age and size, the CRS is correctly installed in the vehicle and the child is properly secured in the CRS.

5.3 Directions for future research

Further research is in progress as well as more in depth statistical analysis. Neighborhood characteristics and routes followed by the parents are studied. The link between the family income and the parental level of education is also examined. In a time of financial crisis for Greece, there are many highly educated parents that have low earnings, countering the expectation that higher educated parents would have a higher income.

An observational study is also in progress. The use of restraint systems will be recorded and compared with the results of this study. The observations include caregivers escorting children by motorbike and child-caregiver interactions, when walking to the nursery school. Potential unsafe and illegal behaviors, such as the use of mobile phones by drivers, are also considered.

Questionnaires are distributed in municipality nursery schools and observational studies are carried out in several selected areas of Greece. The results of each area will be used for valuable comparisons.

REFERENCES

1. Agran, P.F., D.G. Winn, C. L. Anderson, C. Del Vale (1998) Family, social, and cultural factors in pedestrian injuries among Hispanic children. Injury Prevention, Vol 4, pp. 188-193.
2. Antonopoulos, K., Alexopoulos, D. A., & Maridaki-Kassotaki, K. (2012). Perceptions of father parenting style, empathy, and self-esteem among Greek preadolescents. Marriage & Family Review. Vol. 48, pp. 293-309.
3. Arapoglou, V., Sayas J. P. (2009). 'New Facets of Urban Segregation in Southern Europe. Gender, Migration and Social Class Change in Athens', European Urban and Regional Studies. Vol. 16, pp. 345–362.
4. Burgess, S., D. Wilson, R. Lupton (2005) Parallel lives? Ethnic segregation in schools and neighborhoods. Urban studies, Vol 42, pp. 1027-1056.
5. Dunbar, G., Lewis, V. and Hill, R. (2002) Parent child interaction and road behaviour: an exploratory study. British Journal of Developmental Psychology. Vol. 20, pp. 601-622.
6. Emery, K.D. and S.G. Faries, (2008) The lack of motor vehicle occupant restraint use in children arriving at school. Journal of School Health, Vol. 78, pp. 274-279.
7. Ginsburg KR, Durbin DR, García-España JF, Kalicka EA, and Winston FK. 2009. Associations between parenting styles and teen driving, safety-related behaviors and attitudes. Pediatrics. Vol. 124, pp. 1040-51.
8. Hellenic Statistical Authority (2014), http://www.statistics.gr/portal/page/portal/ESYE/PAGE-interactive-census-map
9. Keller, H., Papaligoura, Z., Kuensemueller, P., Voelker, S., Papaeliou, C., Lohaus, A., Lamm, B., Kokkinaki, T., Chrysikou, E., & Mousouli, V. (2003). Concepts of mother-infant interaction in Greece and Germany. Journal of Cross-Cultural Psychology. Vol. 34, pp. 677-589.
10. Kontogiannis, T., Z. Kossiavelou, N. Marmaras, (2002). Self-reports of aberrant behaviour on the roads: errors and violations in a sample of Greek drivers, Accident Analysis and Prevention Vol.34, pp. 381-399.

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11. Koppel, S., C. Muir, L. Budd, A. Devlin, J. Oxley, J. L. Charlton, S. Newstead (2013). Parents' attitudes, knowledge and behaviours relating to safe child occupant travel. Accident Analysis and Prevention. Vol. 51, pp. 18-26.

12. Laflamme,L., F. Diderichsen, F. (2000). Social differences in traffic injury risks in childhood and youth a literature review and research agenda. Injury Prevention. Vol.6, pp. 293-298.

13. Lam, L. T. (2000). Factors associated with parental safe road behaviour as a pedestrian with young children in metropolitan New South Wales, Australia. Accident Analysis and Prevention, Vol. 33, pp. 203-210.

14. Lennon, A.J. (2012). Has increasing the age for child passengers to wear child restraints improved the extent to which they are used? Results from an Australian focus group and survey study. Vulnerable Groups & Inclusion 3

15. Moustaki, M., E. Petridou , D. Trichopoulos (2001). Person, time and place coordinates of pedestrian injuries: a study in Athens. Acta Paediatrica, Vol. 90, pp. 558-562.

16. Sampson, R.J., J.D. Morenoff and T. Gannon-Rowley, (2002) Assessing neighborhood effects: social processes and new directions in research. Annual Review of Sociology, Vol 28, pp. 443-478.

17. Sirad, J. R. and M. E. Slater, (2008). Walking and bicycling to school: a review. American Journal of Lifestyle Medicine (2008), pp.372-396.

18. Steinberg, L., NS Mounts, SD Lamborn, SM Dornbusch (1991). Authoritative parenting and adolescent adjustment across varied ecological niches. Journal of Research on Adolescence Vol. 1, pp. 19-36.

19. Timperio, A., Ball, K., Salmon, J., Roberts, R., Giles-Corti, B., Simmons, D., Baur, L. A. & Crawford, D. (2006). Personal, family, social, and environmental correlates of active commuting to school. American journal of preventive medicine, *30*(1), 45-51.

20. Triandis, H. C. (2002). Subjective Culture. *Online Readings in Psychology and Culture, 2*(2). http://dx.doi.org/10.9707/2307-0919.1021

21. Van Loon, J., L.D. Frank, L. Nettlefold, P.J. Naylor (2014). Youth physical activity and the neighbourhood environment: Examining correlates and the role of neighbourhood definition. Social science and Medicine, Vol 104, pp. 107-115.

22. Yu, C. Y. and X. Zhu, (2015). Impacts of residential self –selection and built environments on children's walking to school behaviors. Environment and Behavior, Vol 47, pp 268-287.

23. Zeedyk, M. S. and L. Kelly, (2003). Behavioural observations of adult-child pairs at pedestrian crossings. Accident Analysis and Prevention, Vol.35, pp. 771-776.

24. Zuniga, K. D., (2012). From barrier elimination to barrier negotiation: A qualitative study of parents' attitudes about active travel for elementary school trips. Transport Policy, Vol.20, pp. 75-81.