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Road Safety Attitudes and Perceptions of Pedestrians in Europe

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Abstract

The objective of this research is the analysis of road safety attitudes and perceptions of pedestrians in Europe using data from the pan-European SARTRE-4 survey. The SARTRE-4 survey, co-funded by the European Commission, was conducted in 19 European countries, namely 18 EU Member States (Austria, Belgium, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Slovenia, Spain, Sweden) and Israel. A total sample of 1,000 road users was interviewed in each country, using a common questionnaire, with questions on road safety attitudes, perceptions, beliefs, motives etc. The questionnaire was designed with the same structure and methodology as in the previous SARTRE surveys, so that trends over time could be monitored. However, unlike the previous SARTRE surveys, which were devoted exclusively to drivers of passenger cars, the SARTRE-4 survey has been extended to other road users, namely motorcyclists, pedestrians, cyclists and public transport users. In this paper, the responses of pedestrians with respect to their road safety attitudes and perceptions are analyzed, including the perceived risk of walking compared to other transport modes, the perceived risk of speeding vehicles, alcohol, distraction and fatigue, the acceptance of enforcement and penalties, as well as of dedicated safety measures for pedestrians (e.g. 30km/h-zones, sidewalks and crosswalks). Moreover, additional questions specific to pedestrians are analyzed, concerning their motivations for not using a car or a motorcycle, their travel habits and behaviours (e.g. road crossing behaviour, compliance, distractions such as the use of mobile phone), their perceived level of service (e.g. safety, security, facilities available) and their interactions with other road users. Finally, the effects of country characteristics and personal characteristics (e.g. age, gender, annual distance travelled) on the examined attitudes and perceptions are also examined.

Keywords: Road Safety; Attitudes; Perceptions; Pedestrians; Vulnerable Users

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1. Introduction

Pedestrians are the most vulnerable users of road transport networks, and their vulnerability is attributed to their lack of speed, mass and protection, compared to other road users, and also to their particular characteristics and behaviour affecting the nature of their interaction with motorized traffic (OECD, 2001; ERSO, 2011). Knowledge of pedestrian attitudes, perceptions and behaviour may thus assist policy makers in better understanding of pedestrian behaviour issues and safety needs, and in the planning and implementation of measures to improve pedestrian safety.

Although there are several studies analyzing road users' attitudes and behaviour, out of which a number (Assum, 1997; Yannis et al., 2004; Wanlaar and Yannis 2006) are based on the SARTRE 1, 2 & 3 (Social Attitudes to Road Traffic Risk in Europe) research projects, there are not many studies that concern pedestrians' attitudes and behaviour, especially at the international level. Data on pedestrians' attitudes and behaviour can be obtained through interviews using questionnaires, telephone surveys, direct observations, or through a combination of these methods. Most researchers use questionnaires to assess attitudes and behaviour. Yagil (2000) examined the self-reported road-crossing behaviour of young student pedestrians and Granié (2009) explored the effects of sex-stereotype conformity, risk perception and risk-taking behaviour of adolescent pedestrians. Bernhoft and Carstensen, (2008) analyzed preferences and behaviour of older pedestrians and cyclists, while Zhou et al. (2009 examined pedestrians' tendency towards social conformity, intentions, behaviour and perceived risk, using the theory of planned behaviour. Lam (2000) investigated the factors associated with the behaviour of parents as pedestrians travelling with their young children. Direct observations as a method of data collection have been applied by Luby et al. (1999). In several studies, a combination of methods is used for the collection of data on pedestrian's attitudes (Granié, 2007; Diaz, 2002; Sisiopiku & Akin, 2003).

These studies provide useful and interesting results about pedestrian attitudes, perceptions and behaviour; however, they mainly focus on particular aspects and on particular populations, the samples that are examined are small and there is no comparison among different countries. In the ongoing SARTRE 4 research project (www.attitudes-roadsafety.eu), the attitudes and behaviour of a large sample of pedestrians are examined at European level for the first time. The objective of the present study is the analysis of pedestrian road safety attitudes and behaviour in a number of European countries, using SARTRE 4 European survey data. For that purpose, pedestrians' responses to selected questions of the SARTRE 4 questionnaire are analysed, with emphasis on the differences between countries.

2. Data Collection & Methodology

2.1. The SARTRE4 European Survey

The SARTRE4 project focuses on road users' attitudes and perception towards road traffic risk in Europe. More specifically, the objective of the SARTRE4 project is to survey and highlight, with a uniform methodology, many important issues such as mobility experiences, perception of safety needs by different types of road users, opinions and experiences about speeding and impaired driving, attitudes towards motorcycle riders, pedestrians and other road users. It is based upon a common survey carried out in each participating country and upon a shared analysis of the data. The survey involved a personal interview for the completion of an extensive questionnaire. The project is a sequel to the previous three SARTRE projects, with the inclusion of additional groups (other road users such as pedestrians, public transport users, cyclists and motorized two-wheelers).

2.2. The SARTRE4 Data

During the survey period, 21,280 questionnaires were collected (at least 1,000 for each country), between November 2010 and February 2011, from 19 European countries (and related organisations): Austria (KfV), Belgium (IBSR), Cyprus (ETAK), Czech Republic (CDV), Estonia (TUT), Finland (VTT), France (IFSTTAR), Germany (BASt), Greece (NTUA), Hungary (KTI), Ireland (RSA), Italy (SIPSiVi), Netherlands (SWOV), Poland (ITS), Serbia (RTSA), Slovenia (AVP), Spain (DGT), Sweden (VTI) as well as Israel (4Sight). In each country, a minimum of 200 pedestrians were interviewed, based on simple random sampling at national level. The SARTRE4 database, developed from the coding of the questionnaire responses, involved various common questions (CO) that all road users had to complete, followed by a separate section for each category of road user i.e. car drivers (CD), motorcyclists (MC) and other road users (ORU), i.e. pedestrians, cyclists and public transport users.

Here, the data concerning pedestrians are analyzed by means of a descriptive analysis. The distribution of responses for each country was calculated for selected questions. The first part of the analysis concerns the pedestrians' responses to the common part of the questionnaire (CO), and the second part of the analysis concerns the section of the questionnaire dedicated to these other road users (ORU). Pedestrians were selected as those respondents from the ORU group who reported that their most frequent transport mode in the last twelve months was neither passenger car nor motorcycle and who reported non-zero daily walking distance travelled.

3. Results

3.1. Pedestrians' responses to the common part of the questionnaire

The common section of the SARTRE4 questionnaire consisted of general questions on road safety and other related topics. The first question was on the frequency of using various transport modes. In the last year, the vast majority of pedestrians travelled less than once a month by car as a driver, but it was notable that most pedestrians travel by car as a passenger one to four times a week or one to three times a month. The second question was associated with pedestrians' opinions about some important topics, such as congestion, crime, pollution etc. Most pedestrians are very or fairly concerned about crime, pollution, health care, unemployment and road accidents (~70%) with great variation in pedestrian concern about congestion across the different countries.

The following three questions of the CO section were associated with road safety in general. The percentage of those pedestrians who consider the roads to be very or fairly safe has a great variation among the countries, ranging from 22% in Poland to 92% in Finland as can be observed in Figure 1. A similarly great variation in pedestrians' responses is also observed in the two questions thereafter, which have to do with the perceived Government concern about road safety, and with the perceived improvement in the safety of roads over the past ten years respectively; these results are obviously affected by the related situation in each country (e.g. road safety policy and priorities, road infrastructure measures etc.).

Other questions concern the acceptance of various road safety measures and penalties. The majority of respondents are "very" or "fairly" in favour of using speed limit devices in cars (78%), black boxes (80%), fatigue detection devices (84%), and alcolocks in cars (87%). The acceptance of alcolocks for recidivist drink-driving car drivers is greater compared to all car drivers. Moreover, the vast majority of pedestrians are "very" or "fairly" in favour of using cameras for red light surveillance (83%), surveillance of speeding at a single point (83%), or between two distant points (76%). However, it is interesting to note that the percentage of pedestrians who strongly support more '30 km/h' zones is much lower (37%) compared to the other measures, despite this being a measure explicitly aiming to improve pedestrian safety (see Figure 2).

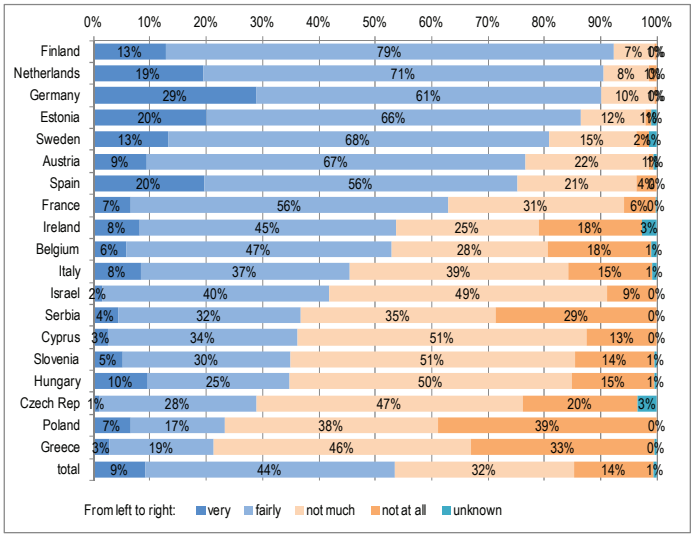

Fig. 1. Pedestrians' responses by country. "How safe do you think the roads are in our country to travel on?" (Question CO03)

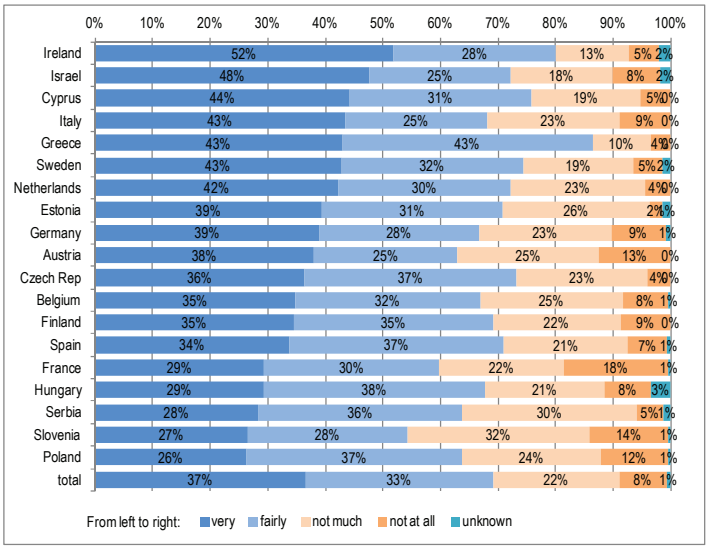

Fig. 2. Pedestrians' responses by country. "How much would you be in favour of more '30 km/h' zones in built-up areas?" (Question CO07d)

Regarding enforcement and penalties, while most (~70%) of pedestrians "strongly agree" or "agree" with more severe penalties for speeding offences, there is some variation between countries. Furthermore, most (~90%) pedestrians "agree" or "strongly agree" with more severe penalties for drink-driving offences. Most (~80%) pedestrians "agree" or "strongly agree" with more severe penalties for not wearing helmets on motorcycles. Most pedestrians (76%) also "agree" or "strongly agree" with more severe penalties for using handheld phones while driving. Finally, most pedestrians (60%) do not ("not much" or "not at all") consider walking to be dangerous with regard to accidents.

3.2. Pedestrians' responses to the dedicated section of the questionnaire

The lowest incidence of pedestrians that "never" or "rarely" cross the road when a red light for pedestrians is displayed can be found in Sweden (45%) and Cyprus (49%). The highest incidences can be found in Poland (88%), Slovenia (87%), Hungary (85%) and the Czech Republic (77%). The European average is 71% (Figure 3).

On the other hand, 7% of pedestrians in Cyprus "always" cross at places other than pedestrian crossings (behaviour that is lower than 4% in all other countries). Cyprus also has the second highest incidence of pedestrians who cross "often" and "very often" at places other than pedestrian crossings (35%) with Sweden (36%) having the highest (Figure 4).

Figure 5 shows that the lowest incidence of pedestrians that "never" avoid too dangerous streets or intersections can be found in Greece (5%), Cyprus and Estonia (7%). The highest incidence of pedestrians that "never" avoid too dangerous streets or intersections can be found in Finland (45%).

With regard to distractions while walking (Figure 6), the lowest incidence of pedestrians that "never" or "rarely" make or answer a call with a handheld phone can be found in Sweden (18%). There is a great variation in the pedestrians who "never" make or answer a call with a handheld phone ranging from 3% (Estonia) to above 45% (Hungary and Slovenia). Most pedestrians reported that they "never" use MP3/iPod/music devices.

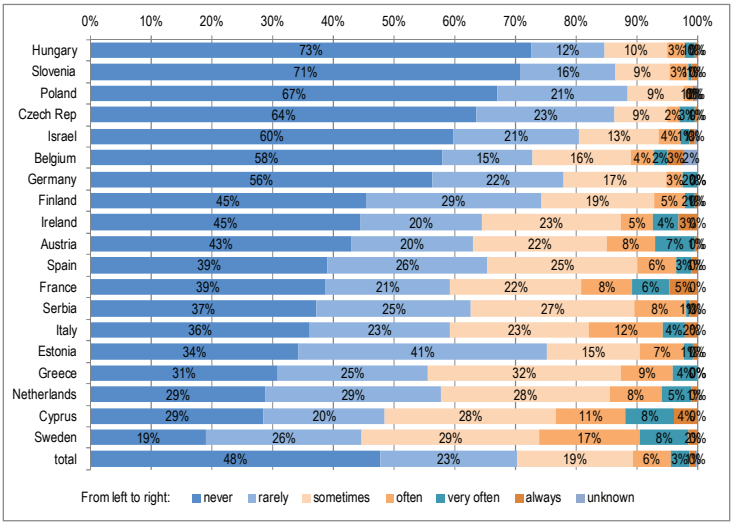

Fig. 3. Pedestrians' responses by country. "As a pedestrian how often do you cross the road when it's a red light for pedestrians?" (Question ORU3a)

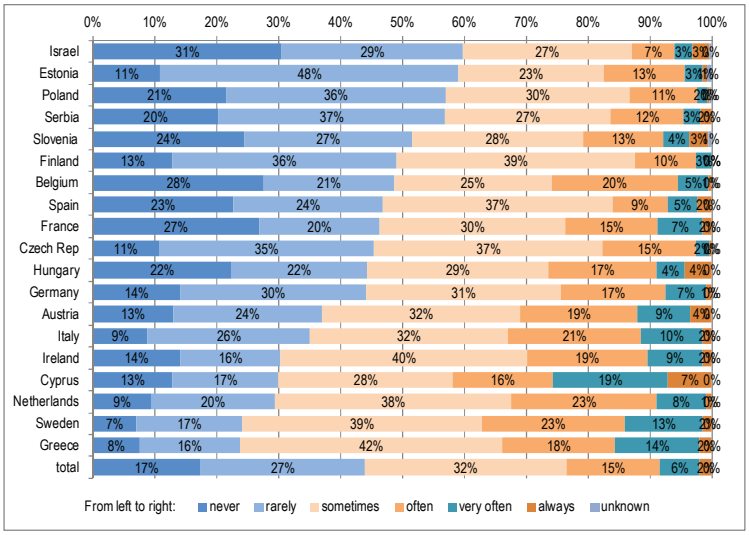

Fig. 4. Pedestrians' responses by country. "As a pedestrian how often do you cross at places other than the pedestrian crossing?" (Question ORU3b

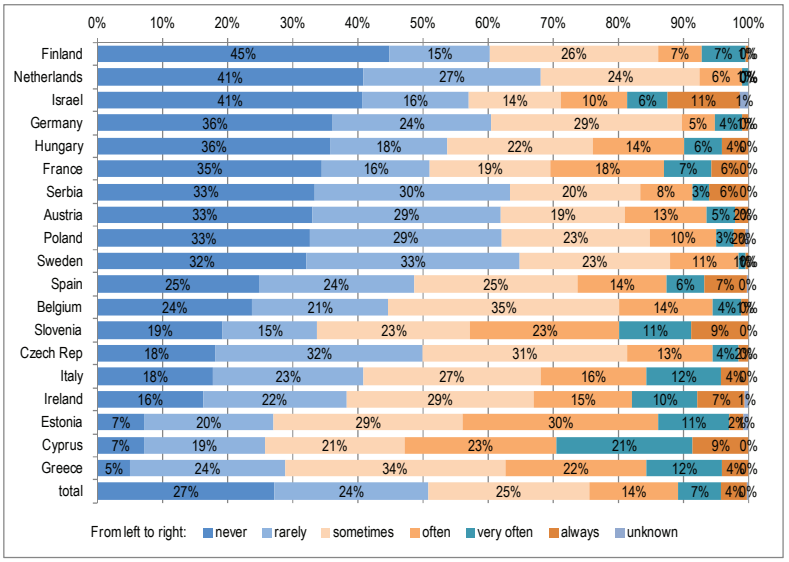

Fig. 5. Pedestrians' responses by country. "As a pedestrian how often do you avoid too dangerous streets or intersections?" (Question ORU3c)

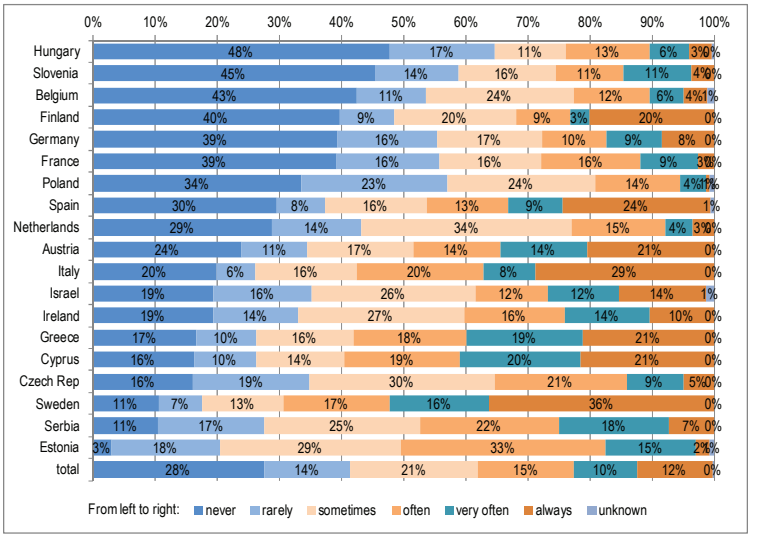

Fig. 6. Pedestrians' responses by country. "As a pedestrian how often do you make/answer a call with handheld phone?" (Question ORU3f)

Another group of questions concern pedestrians' perceived level of service. Almost half of all pedestrians are "very" or "fairly" satisfied with pavements with a great variation in the countries whose pedestrians are "very" satisfied ranging from 2% - 4% (Estonia, Hungary, Czech Republic and Greece) to higher values of 30% - 42% (Austria, Finland, Israel, France and Sweden). Regarding street lighting, the highest incidence of pedestrians that are "very" or "fairly" satisfied with the number of street lights can be found in Austria (78%) and Estonia (77%) with an overall mean of 63%. The highest incidence of pedestrians that are "not at all" satisfied with the number of street lights can be found in Greece (79%) and Cyprus (55%) with an overall mean of 37%.

It can be observed from Figure 7 that most pedestrians are "not much" or "not at all" satisfied with the speed of traffic. The highest incidence of pedestrians that are "very" or "fairly" satisfied with the speed of traffic is found in Finland (75%). The lowest incidence of pedestrians that are "very" satisfied with the speed of traffic is found in Netherlands, Hungary and Germany (all 2%) and the highest in Finland (19%), Israel (17%) and Sweden (16%).

Moreover, it seems that the majority of pedestrians is "not much" or "not at all" satisfied with the volume of traffic (Figure 8) with the highest incidence of pedestrians that are "not much" or "not at all" satisfied with the volume of traffic found in the Czech Republic (74%), Greece (72%), Slovenia (71%) and Poland (72%).

The highest incidence of pedestrians that are "very" or "fairly" satisfied with safety can be found in Finland (85%) with most countries having an incidence greater than 50%. The highest incidence of pedestrians that are "not much" or "not at all" satisfied with safety are observed in Greece (83%) and Cyprus (80%).

The majority of EU pedestrians are "very" or "fairly" satisfied with the number of crossing points (Figure 9) with the highest incidence found in France (76%), Finland (76%) and Netherlands (74%). The greatest incidence of pedestrians that are "not much" or "not at all" satisfied with the number of number

of crossing points can be found in Greece (79%) and Cyprus (78%), compared to the overall mean of 43%.

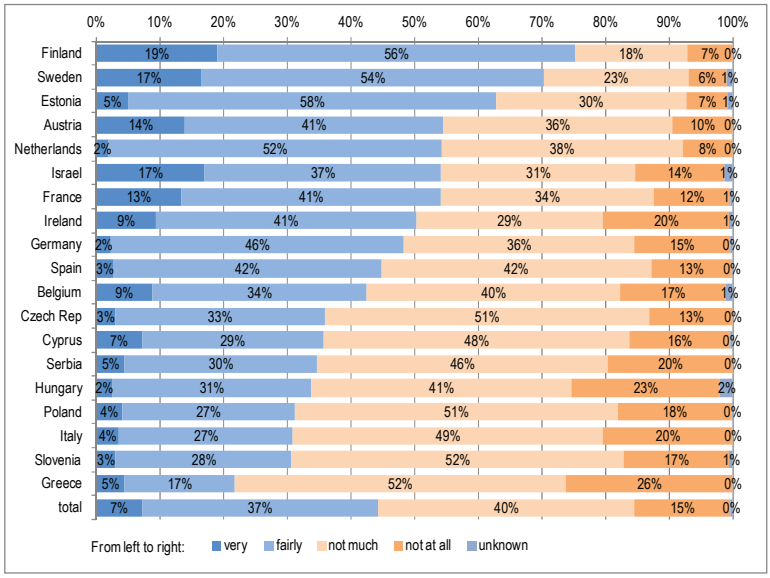

Fig. 7. Pedestrians' responses by country. "As a pedestrian how satisfied are you with the speed of traffic?" (Question ORU4d)

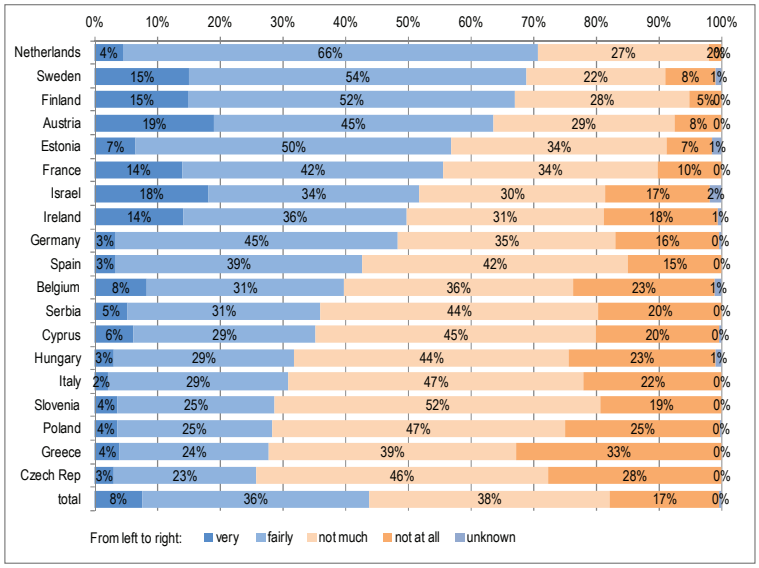

Fig. 8. Pedestrians' responses by country. "As a pedestrian how satisfied are you with the volume of traffic?" (Question ORU4e)

Almost one in four pedestrians are "often" annoyed by car drivers, and more than one in ten are "very often" annoyed by car drivers. In contrast, almost one in four pedestrians are "often" annoyed by motorcyclists. The highest incidence of pedestrians that are "never" or "rarely" annoyed by motorcyclists

is in Sweden (74%). In Greece, Czech Republic, Estonia, Austria, Germany, Poland, Italy, Slovenia and Serbia more than 25% of pedestrians are “often” or “very often” annoyed by motorcyclists. Most pedestrians are “never” or “rarely” annoyed by bicyclists.

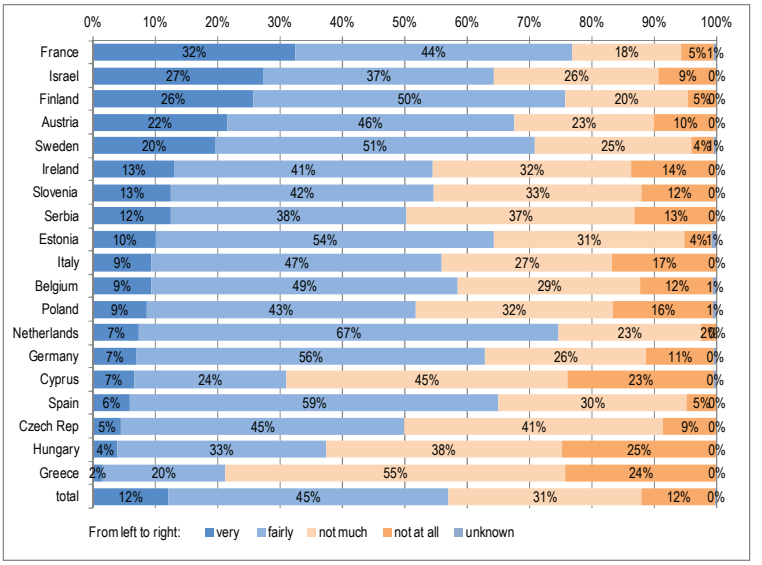

Fig. 9. Pedestrians’ responses by country. “As a pedestrian how satisfied are you with the number of crossing points?” (Question ORU4g)

4. Conclusions

The descriptive analysis of the pedestrian’s responses, leads to a number of remarks. From the more general questions of the common section, it can be observed that aside from walking, pedestrians travel frequently as car passengers and as public transport passengers. In general, pedestrians seem to be very concerned about several socio-economic issues, including pollution, unemployment and health care. On the other hand, only in a few countries pedestrians seem to worry about congestion. Pedestrians seem to be more satisfied with their roads, believe that they have become safer and perceive important concern of the governments for road safety in northern and western European countries, while the opposite is the case for southern and central European countries. Pedestrians seem to support safety measures for speeding, drink-driving and fatigue, especially for recidivist drivers. It is interesting though, that they seem to support somewhat less the establishment of more ‘30km/h’ zones, even though it is a dedicated pedestrian safety measure. Furthermore, pedestrians agree with more enforcement and penalties. The penalties that they support the most concern drinking and driving. However, pedestrians are not as supportive of more severe penalties for speed offences. Generally, it is seen that pedestrians are not that supportive of measures that aim to decrease traffic speed, which seems counterintuitive. However, it may be attributed to them being unwilling to accept more time spent in cars or public transport as passengers.

From the dedicated section of the questionnaire, a number of behavioural patterns are identified. Between 10% and 30% of pedestrians often cross roads despite a red light showing. A more widespread behaviour appears to be crossing at non-designated locations, but tending to avoid roads or intersections

that appear to be dangerous. As far as their perceived level of service is concerned, the lowest satisfaction with the road environment (sidewalks, lighting and pavements) is consistently observed in Greece, Cyprus, Hungary, and also Italy, Poland and Estonia. Pedestrians are not satisfied with the speed of traffic, but they are also not strongly in favour of speed reducing measures. Finally, pedestrians are annoyed with car drivers and less annoyed with motorcyclists. The results of these questions appear to be influenced by the level of mobility of each mode in each country (for example, there was increased pedestrians' annoyance with motorcyclists in Greece and bicyclists in the Netherlands).

The results of the SARTRE4 survey may be useful to researchers and policy makers, given that improved understanding of pedestrians' needs, motivations, opinions and behaviours is achieved, and appropriate measures may be identified to better respond to pedestrians' needs and behaviour. As the next step in the analysis, more in-depth statistical analyses will be performed. Statistical analysis may lead to further validation of the above trends and particularities, and to the identification of groups of pedestrians, or groups of countries, with similarities in terms of pedestrian attitudes and behaviour. In this context, the data will be analysed in relation to other parameters including area type, town size, gender, age etc.

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