

# European car drivers' opinions about road safety measures and in-car devices

*Analysis of SARTRE 2 survey results in terms of how European car drivers differ in their preferences for road safety measures*

## Report documentation

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## Summary

In 1991, a representative survey of drivers was conducted in fifteen European countries. This project was named *SARTRE* which stands for Social Attitudes to Road Traffic Risk in Europe. The survey focused on drivers' road behaviour, attitudes and opinions concerning drinking and driving, speeding and seat belt use, opinions on accident causation and on traffic measures, experiences with police enforcement, perceptions of behaviours of other drivers, car preferences, experiences with driving in foreign countries, and risk perception. In 1996 the survey was held again, this time in nineteen European countries and with an improved questionnaire. The new project was termed *SARTRE 2*.

The *SARTRE 2* survey presents us with an unique database on traffic-related attitudes, behaviours and experiences in nineteen different European countries. This database enables us to make comparisons between countries and over time, to study determinants of traffic behaviour and to determine the degree of societal support for different traffic measures.

Chapter 1 presents the findings of straightforward descriptive analysis concerning European opinions about road safety measures. Specifically, the following subjects are described:

- differences in opinions of European drivers about road safety measures - shifts in opinions from *SARTRE 1* to *SARTRE 2*;
- the nations where drivers have shown most frequent or largest shifts in opinion.

Chapter 2 describes the results of a non-linear canonical correlation analysis, focusing on patterns of differences of European car drivers in opinions and norms concerning road safety measures and in-car devices.

Major findings were as follows. In 1996, there is large majority support among European drivers for road safety measures such as improvement of improvement of road standards, improvement of driver training, enforcement of traffic laws, testing of vehicles for safety, road safety campaigns, an European introduction of penalty points system and an European ban on alcohol for beginning drivers.

The introduction of a number on measures (e.g. penalty points system, installation of third braking light) on an European scale is also widely approved among European drivers. The approval for the European installation of a third braking light has increased greatly from minority support in 1991 to clear majority support in 1996. Presumably, the slowly increasing exposure to and (positive) experience with this device in daily traffic in the nineties has caused this considerable opinion shift.

The questions which show the largest variation between European countries pertain to the necessity of improving the standards of roads and to the strictness regarding drinking-and-driving. This result is in line with an earlier analysis of *SARTRE 1* results in 1992, in which it was found that these questions were part of the two major discriminating dimensions between European countries.

Within EU member states, the opinions on these two issues tend to differ along a North-South line. Drivers of rather Northerly located EU-states (Sweden, Finland, Germany, Netherlands, Austria) tend to completely reject any personal freedom in drinking and driving and, at the same time, are not so much in favour of their government undertaking more action to improve the standards of roads. On the other hand, drivers of Southerly located EU-states (Italy, Greece, Portugal, Spain) are far more lenient in regard to personal freedom in drinking and driving and are more in favour of government taking steps to improve the standards of roads.

Specific recommendations are given regarding the design of road safety campaigns, publicity about drinking and driving and priorities for future transport planning.

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# 1. Introduction

In 1991, a representative survey of drivers was conducted in fifteen European countries. This project was named *SARTRE* which stands for Social Attitudes to Road Traffic Risk in Europe. This survey covered a wide spectrum of biographical driver data as well as opinions and attitudes to practically all subjects of road safety. More specifically, the survey focused on drivers road behaviour, attitudes and opinions concerning drinking and driving, speeding and seat belt use, opinions on accident causation and on traffic measures, experiences with police enforcement, perceptions of behaviours of other drivers, car preferences, experiences with driving in foreign countries, and risk perception. It has been carried out by national poll institutes, partly by means of the random-route method and partly by the quota method. Altogether more than 17,000 drivers participated in the survey. The overall results of the project have been described in two books in English language (SARTRE, 1994a; 1994b). Specific results concerning opinions on road safety measures have also been published in a separate English report (Goldenbeld, 1994).

One of the aims of SARTRE was to monitor car drivers' changes in opinions, attitudes and norms over time. Therefore it was intended that the survey should be repeated within a four or five year interval. In 1996 the survey was held again, this time in nineteen European countries and with an improved questionnaire. The new project was termed *SARTRE 2*.

The SARTRE 2 survey presents us with an unique database on traffic-related attitudes, behaviours and experiences in nineteen different European countries. This database enables us to make comparisons between countries and over time, to study determinants of traffic behaviour and to determine the degree of societal support for different traffic measures. The SARTRE 2 results have been published by the SARTRE group (1998a, b) in two reports. A summary of main findings and recommendations was given in a special report to the EU commission DG VII (SARTRE steering committee, 1998c). Also, there is a separate report on Dutch SARTRE 2 findings, however in Dutch language (Goldenbeld, 1998).

This report answers the question of how European car drivers are different and similar in their opinions about road safety measures and in-car devices. In chapter 1 this question is studied on the basis of simple descriptive statistics. Chapter 2 addresses the same question with the use of more sophisticated statistical technique.

## 2. Descriptive analysis

### 2.1. Introduction

This chapter presents the major findings concerning European opinions about road safety measures. Specifically, we will describe:

- differences in opinions of European drivers about road safety measures - shifts in opinions from SARTRE 1 to SARTRE 2;
- the nations where drivers have shown most frequent or largest shifts in opinion.

The following description of results is partly quantitative, partly qualitative. To reduce the bulk of data percentages in tables and figures are given for one answer category or for combination of answer categories.

The chapter is arranged as follows. § 2.2 describes the results concerning the questions about the amount of effort the national government should devote to stimulate road safety measures. § 2.3 addresses the norms concerning penalties, drinking-and-driving, car advertisements and public transport. The results concerning approval for the introduction of certain road safety measures on an European scale are presented in § 2.4. § 2.5 and 2.6 deal with a number of survey questions that were only asked in 1996, not in 1991. At first, § 2.5 deals with the questions about the amount of consideration which should be given to different transport modes. Subsequently, § 2.6 describes preferences for in-car telematics devices. Finally, the chapter is concluded with a general discussion in § 2.7.

### 2.2. Road safety measures that ought to be stimulated by government

Questions 2a to 2e all refer to the amount of attention the government should spend to different road safety measures. *Table 2.1* presents the mean percentages on these questions.

Opinion: 'Strongly in favour of' or 'in favour of' government devoting more effort to:	Mean % EU
... improving driver training	78%
... more enforcement of traffic laws	70%
... more road safety campaigns	72%
... test more vehicles	63%
... improve the standards of roads	84%

Table 2.1. *Preferences for active government role in stimulating traffic safety measures (Questions 2a - 2e).*

#### *General findings*

For each of five measures (improve driver training, more enforcement, testing of vehicles, improve standards of roads) a clear majority of national drivers is in favour that their national government should devote more attention to these measure. According to EU drivers, the national

government should first of all devote more attention to improving the standards of roads (84% strongly in favour/in favour), and should in second place improve driver training (78% strongly in favour/in favour). The support of EU drivers for government stimulation of more road safety campaigns (72% (strongly) in favour), more enforcement of traffic laws (70% (strongly) in favour), and of more testing of vehicles (63% (strongly) in favour) is somewhat less, but of course still considerable.

*Differences between countries*

Looking at more global patterns in results, we find the following. On at least three out of five measures in 1996, the Finnish, Swedish, Swiss and Dutch drivers tend to be among those who are least strongly in favour of active government stimulation. For three out of five measures in 1996, the Polish and Irish drivers tend to be among those who are most strongly in favour for their government taking a more active role. The largest variation in opinions is found on the question how much attention the government should spend to improve the standards of the roads (*Figure 2.1*).

The least variation was found in opinions of European drivers about government support for road safety campaigns.

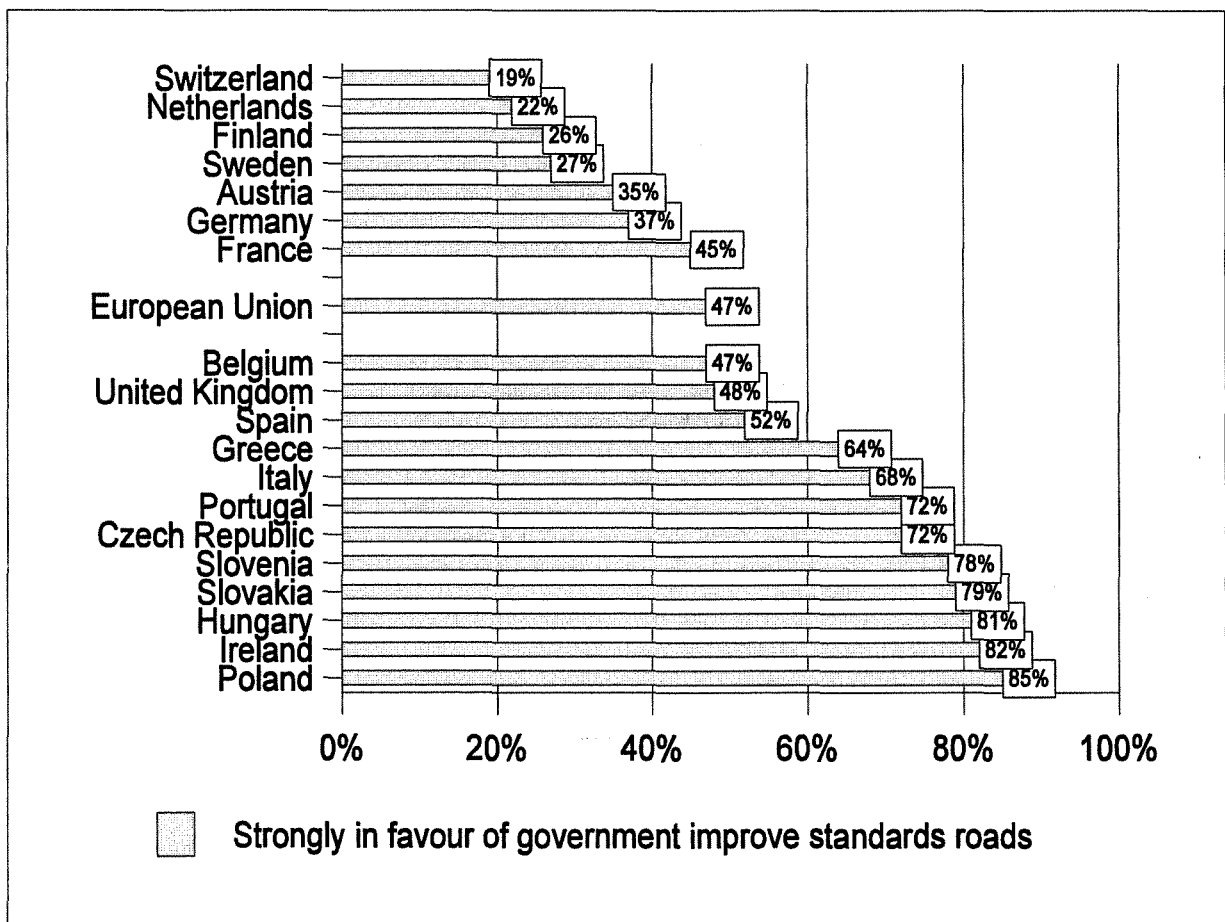


Figure 2.1. Opinions on the question how much attention the government should spend to improve the standards of the roads.

As can be seen in *Figure 2.1*, it seems that drivers in countries with high quality road infrastructure (e.g. Switzerland, Netherlands) tend not to be



strongly in favour of their government devoting more attention to the standards of roads, whereas drivers in countries with less developed or maintained road infrastructure (e.g. Poland, Ireland, Hungary) tend to be very strongly in favour of an active government role in this respect.

*Changes between SARTRE 1 and 2*

Table 2.2 shows the really large shifts in opinion over time, concentrating on those national groups of drivers who differ in opinion from SARTRE 1 to SARTRE 2 with more than 9 percentage points in one or another direction.

Opinion: Strongly in favour /in favour of government devoting more effort to:	Sample	Country						
		France	Hungary	Italy	Portugal	Spain	Sweden	Switzerland
2a. improve driver training	SARTRE 1		74%		77%			
	SARTRE 2		64%		91%			
2b. more enforcement of traffic laws	SARTRE 1			79%	78%		66%	
	SARTRE 2			91%	68%		57%	
2c. have more road safety campaigns	SARTRE 1		49%					63%
	SARTRE 2		60%					42%
2d. test road worthiness of more vehicles	SARTRE 1	72%	56%		81%	71%		50%
	SARTRE 2	43%	70%		45%	54%		34%
2e. improve the standards of roads	SARTRE 1	no large changes						
	SARTRE 2							

Table 2.2. Large shifts of opinion over time for specific national groups. Abbreviations: Hung=Hungary, Portug=Portugal, Swed = Sweden, Switz = Switzerland.

Interestingly, Table 2.2 shows that the support for government devoting more effort in testing the road worthiness of more vehicles has seen a large decrease in France, Portugal, Spain and Switzerland. Only, Hungarian drivers show a large increase in their preference for this government action. Presumably, the decline in support for further government stimulation in this field has to do with a satisfaction with the established procedures of (yearly) testing. From SARTRE 1 to SARTRE 2 Hungarian drivers have become more enthusiastic about having more road safety campaigns and having more tests of road worthiness of vehicles, whereas Swiss drivers have decidedly become less supportive of these measures. The Swiss may fairly well be satisfied with existing state of affairs, whereas the Hungarian drivers seek ways to promote road safety. From SARTRE 1 to SARTRE 2 the Portuguese drivers have become decidedly more supportive of improving driving training, but less supportive of enforcement of traffic laws and testing of more vehicles.

**2.3. Norms concerning penalties, drinking and driving, car advertisements and public transport**

Questions 3a to 3d pertain to the degree of agreement with four normative statements concerning severity of penalties, freedom in drinking and driving, freedom of manufacturers to use appeal of speed in advertisements and the

need for better public transport. *Table 2.3* summarizes the main differences between European drivers in respect to these normative issues.

Opinion:	Mean EU %
Strongly agree or agree with: penalties for traffic offenses should be more severe	54%
Strongly disagree or disagree with: people should be free to decide for themselves how much they drink and drive	77%
Strongly agree or agree with: in car advertisements manufacturers should not be allowed to stress speed	47%
Strongly agree or agree with: better public transport is needed	84%

*Table 2.3. Agreement or disagreement with statements (Questions 3a - 3d).*

#### *General findings*

A large majority (84%) of all EU drivers (strongly) agrees with the need for better public transport; more than half (54%) of EU drivers (strongly) agree with the necessity of more severe traffic penalties; slightly less than half (47%) of EU respondents (strongly) agrees with a restriction on the freedom of car manufacturers to use the appeal of speed in car advertisements.

#### *Differences between countries*

There is not much difference in opinions of EU drivers concerning the necessity of more severe penalties, the need for better public transport and the freedom of car manufacturers to use speed as an appealing element in car advertisements. There is large variation in the tolerance of European drivers as regards freedom in drinking and driving (see *Figure 2.2*).

To be sure, in all of the survey-countries, there is only minority support for the statement that people should be free to decide for themselves how much they want to drink before driving. The general norm is that drivers should not be free to decide for themselves how much they want to drink before driving. But whereas seven or eight out of every ten drivers in Northern countries like Finland, Sweden, Netherlands, UK strongly disagrees with any freedom in drinking and driving, only three or four out of every ten drivers in Southern countries (Greece, Italy, France, Spain, Portugal) strongly disagrees.

This finding is in line with earlier results. In an earlier analysis of European differences in opinions about traffic safety measures, the question about freedom in drinking and driving also divided countries along a Northern-Southern line.

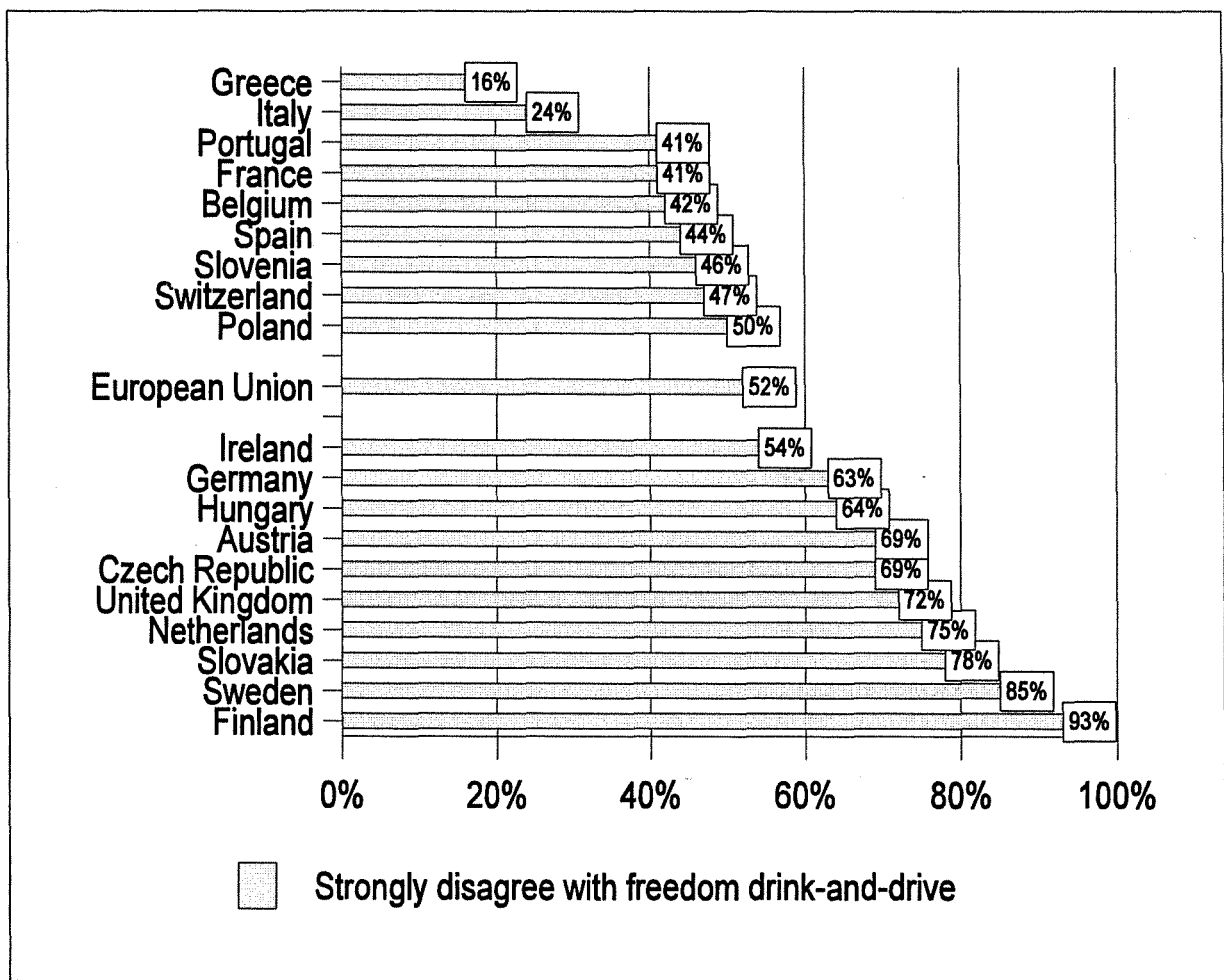


Figure 2.2. Opinions on freedom in drinking and driving.

#### Changes between SARTRE 1 and SARTRE 2

Table 2.4 presents the large shifts in opinion over time, concentrating on those national groups of drivers who differ in opinion from SARTRE 1 to SARTRE 2 with more than 9 percentage points in one or another direction.

Remarkably, the support for more severe penalties for driving offences has decreased considerably in Italy, Sweden, Switzerland and UK. Also in Italy, Portugal and Switzerland there has been a large decrease in the disapproval for drinking and driving, whereas Hungary shows a large increase in disapproval.

Combining the results of Table 2.2 and Table 2.4 a pattern emerges. Portuguese and Swiss drivers have consistently become less enthusiastic for a number of road safety measures, whereas Hungarian drivers have become more supportive of a number of measures. Italian drivers have become more supportive of more enforcement of traffic laws (Table 2.2) and of less freedom for car manufacturers to stress speed (Table 2.4). Together these results may point to an increasing concern among Italian drivers of the dangers of reckless, high speed driving.

Opinion	Sample	Country						
		Hungary	Italy	Portugal	Spain	Sweden	Switzerland	UK
3a. Strongly agree: Penalties for driving offences much more severe	SARTRE 1		68%			69%	54%	70%
	SARTRE 2		54%			51%	40%	60%
3b. Strongly disagree: people self decide how much drink and drive	SARTRE 1	44%	41%	54%			60%	
	SARTRE 2	64%	25%	42%			47%	
3c. Strongly agree: Not allow car manufacturers to stress speed in advert.	SARTRE 1		36%	35%				
	SARTRE 2		63%	25%				

Table 2.4. Large shifts of opinion over time for specific national groups.

## 2.4. Degree of approval for European introduction of measures

Questions 27a to 27e ask for the degree of approval for introduction of road safety measures in all European countries. The answer scale for these questions has changed between 1991 and 1996 from 'In favour'/'Against' to 'In favour very'/'In favour fairly'/'In favour not much'/'In favour not at all'. The mean percentages on these questions are given in Table 2.5.

Opinion: Very/Fairly in favour of ...	Mean EU %
... a penalty points system	70%
... restrict maximum speed of vehicles	54%
... regular technical check-ups	85%
... installation of third braking light	58%
... no alcohol for new drivers	81%

Table 2.5. Opinions on European introduction of road safety measures (Questions 27a - 27e). Answer scale 1996: In Favour very/fairly/not much/not at all.

### General findings

In 1996, there is ample majority support for the European introduction of regular technical check-ups for safety purposes, a penalty points system, a zero alcohol limit for new drivers, and the installation of a third braking light.

### Differences between countries

Especially the issue of an European introduction of a requirement that car manufacturers restrict the maximum speed of cars meets a mixed response among European drivers (see Figure 2.3).

As we can see in Figure 2.3, among French, Italian, Belgian, Irish and English drivers there exist a majority favouring that car manufacturers take steps to limit the speed of their cars, whereas Czech, Swedish, Polish, Hungarian, Slovakian, German, and Swiss drivers do not favour such steps.

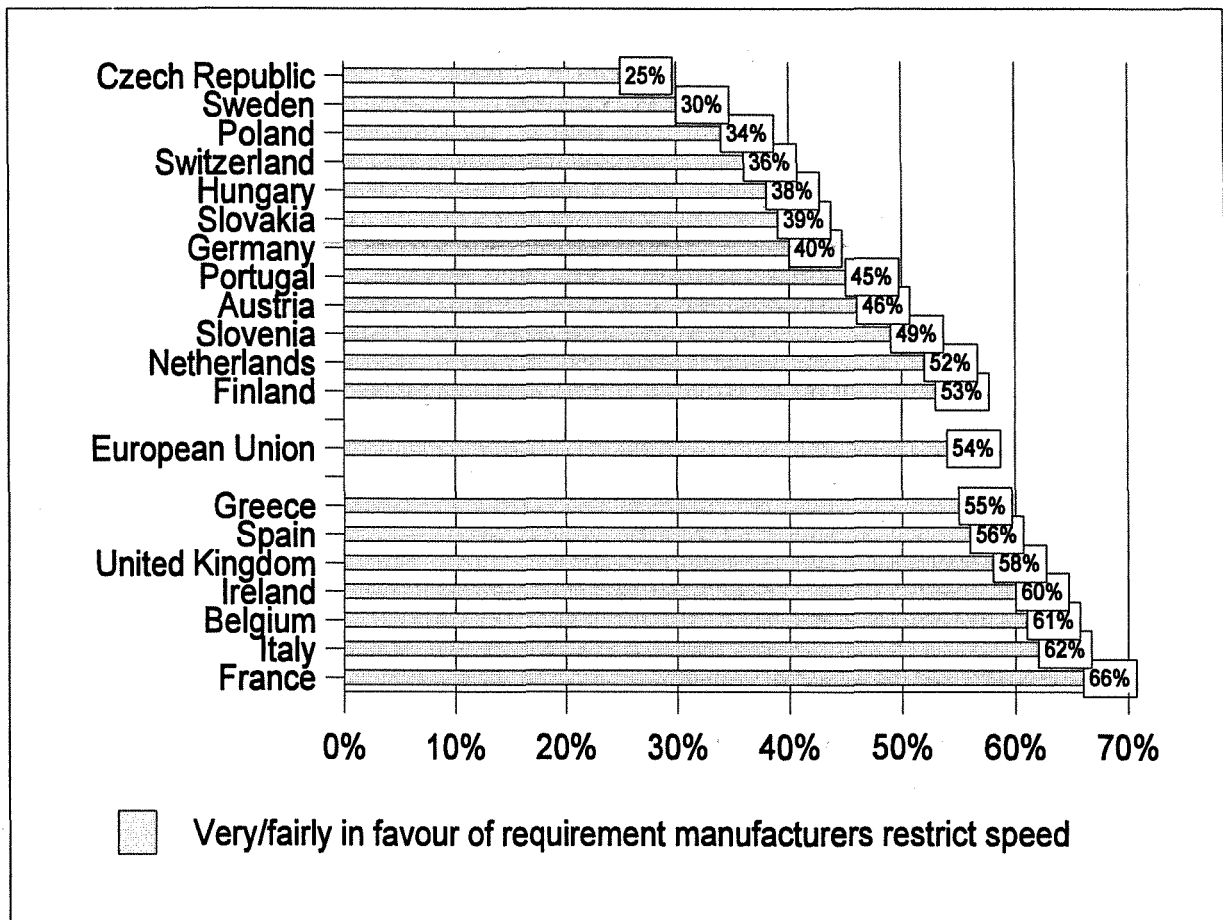


Figure 2.3. Opinion on an European introduction of a requirement that car manufacturers restrict the maximum speed of cars.

If we take a more general look at answer patterns on all questions 27a to 27e, the Swiss drivers stand out. For four out of five questions concerning European introduction of measures, the Swiss drivers are found among the groups who *least favour* the European introduction of a measure. This may reflect a more general negative attitude of the Swiss towards introduction of measures on an European scale.

Surprisingly, Italian and Grecian drivers who tend to be somewhat less strict in regard to freedom in drinking and driving, are very supportive of the introduction of a zero alcohol limit for new beginning drivers. It may be that a so-called 'double norm' is operative in regard to drinking and driving. When we also take into account the rather large proportion among Italian, French, Grecian, Spanish drivers who consider drinking and driving always to be a cause for accidents, there emerges an even fuller picture of the complex attitude structure/mentality in regard to drinking and driving. In the discussion in § 2.8 we'll return to these findings.

#### *Change between SARTRE 1 and SARTRE 2*

The change in answer categories makes strict statistical testing not possible. We can compare the SARTRE 1-'In favour'-percentages with the SARTRE 2-'Very/fairly favour'-percentages at face value. Table 2.6 describes the large shifts in opinion over time, concentrating on those national groups of

drivers who differ with more than 9 percentage points in one or another direction.

It appears that the drivers in some nations in the mean have hardly changed their (extreme) position. In both SARTRE 1 and SARTRE 2 the French, Belgian and Swiss drivers are least in favour of the European introduction of a penalty points system. In both survey years, drivers in the UK make up the largest support for the introduction of a penalty points system. In both SARTRE 1 and SARTRE 2, French and Irish drivers constitute the largest support group for a requirement that car manufacturers restrict the maximum speed of cars. It is interesting to note that the actual experience with a penalty points system has not changed the attitude of French car drivers. In France a penalty points system was introduced since July 1992. By the end of November 1993 only 340,000 motorists had seen their misconduct punished with the deduction of one or more points. This relatively low number was caused by the fact that it often takes quite a long time before the courts have concluded the cases brought before them. Three quarters of the cases concerned speeding. Motorists can try to regain a number of points by attending courses (European Newsletter, 1994, 2, p. 7).

Opinion: In favour (SARTRE 1) or: Very /Fairly in favour (SARTRE 2) of European introduction of	Sample	Country							
		Austria	Belg.	France	Hung.	Italy	Port.	Spain	Switz.
27a. a penalty points system	SARTRE 1	65%	39%		54%	59%			
	SARTRE 2	51%	50%		66%	76%			
27b. requirement that manufacturers restrict maximum speed cars	SARTRE 1		51%		20%	47%			
	SARTRE 2		61%		38%	64%			
27c. regular technical check-ups of all types of vehicles	SARTRE 1			86%			89%	87%	84%
	SARTRE 2			65%			69%	74%	57%
27d. installation third braking light	SARTRE 1	Nearly all countries increase from 30-45% to 50-65%							
	SARTRE 2								

Table 2.6. Large shifts of opinion over time for specific national groups.

As can be seen in *Table 2.6*, the support for the European introduction of a penalty points system and a requirement that car manufacturers do something to limit the speed of their cars has increased among Hungarian, Italian and Belgian drivers. Surprisingly, there has been a decreasing support for the European introduction of regular technical check-ups of all types of vehicles in France, Portugal, Spain and Switzerland. In the same four countries, we also found decreasing support for national government devoting more effort in testing the roadworthiness of more vehicles (*Table 2.2*, question 2d).

The largest change has occurred in the thinking about the European introduction of a third braking light: from minority support in almost all countries in SARTRE 1 to majority support in all countries in SARTRE 2. Presumably, the European obligation to have a third braking light, going

into effect for all passenger cars October 1st 2000, has led both car manufacturers and car drivers to anticipate on installing this device in the car. This has led to an increase of cars with a third braking light installed. For example, in the Netherlands the third braking light was observed in 28% of the passenger cars as opposed to about 5% in the early nineties. Undoubtedly, the frequent occurrence of third braking light in everyday traffic has further made way for a positive attitude towards a general introduction of this safety device.

*Table 2.6* confirms a pattern we noted earlier: from SARTRE 1 to SARTRE 2 Swiss and Portuguese drivers have tended to be less supportive of a number road safety measures and Hungarian drivers more supportive. Looking at the total results of *Table 2.2*, *Table 2.4* and *Table 2.6*, we see that also the Italian drivers have tended to become more supportive of a number of measures.

## 2.5. Opinions about the consideration to be given to modes of transport in the future

### *General findings*

Questions 5a tot 5e do not refer to specific measures, but ask more broadly about the degree of consideration a government should give to specific groups of road users or to specific transport modes when it is making plans for the future. The mean percentages in regard to these questions are reported in *Table 2.7*.

Interestingly, half or more than half of the car drivers state that *very much consideration* should be given to alternatives to car such as walking, cycling or public transport when planning for the future. It seems that even among car drivers there is wide realization of the importance of having alternatives to car transport. The questions 5a tot 5e were not asked in 1991; a comparison over time cannot be done.

Opinion: When planning for the future very much consideration should be given to ....	Mean EU %
... pedestrians	51%
... cyclists	50%
... motorcyclists	37%
... cars	37%
... lorries	42%
... public transport	55%

*Table 2.7. Amount of consideration to be given to transport modes in the future (Questions 5a - 5e).*

### *Differences between countries*

In general the variation on questions 5a to 5e is not large. Question 5a (amount of consideration to be given to pedestrians) has a somewhat larger variation than the rest. The results for this question are given in *Figure 2.4*. As can be seen, Czech, Slovakian, Slovenian, Austrian, Swiss and German drivers tend to consider only a modest role for pedestrians in future planning, whereas Belgian, French, Grecian, Irish, Portuguese, and English

drivers have a majority agreeing with giving very much consideration to pedestrians in future planning.

If we take a look at national differences, two groups of drivers can be distinguished. *Firstly*, it appears that the group of Portuguese, Irish, Polish and Grecian drivers consider it particularly important that their government considers the position of various groups of road users and transport modes in the future. This group of drivers favours that high consideration should be given to various road users and transport modes. It may be that this answer pattern is the result of a more general interest in transport and traffic in these societies. That general interest may be the result of particular fast developments in the area of transport and traffic or of growing awareness of problem areas.

*Secondly*, the group of Czech, Slovenian, Swiss and Austrian drivers tends to consistently favour less consideration to various road users and transport modes. For some reason or other, public interest in traffic and transport may be on a 'low tide' in these countries. In the case of Switzerland and Austria the general feeling may be that the traffic system as it is works quite well and needs not much tampering with in the future. For Czech and Slovenian drivers, the phrasing of the question 'planning for the future' may connote strong political or social dimensions; hearing these questions political issues rather than traffic issues may come to the mind of these drivers.

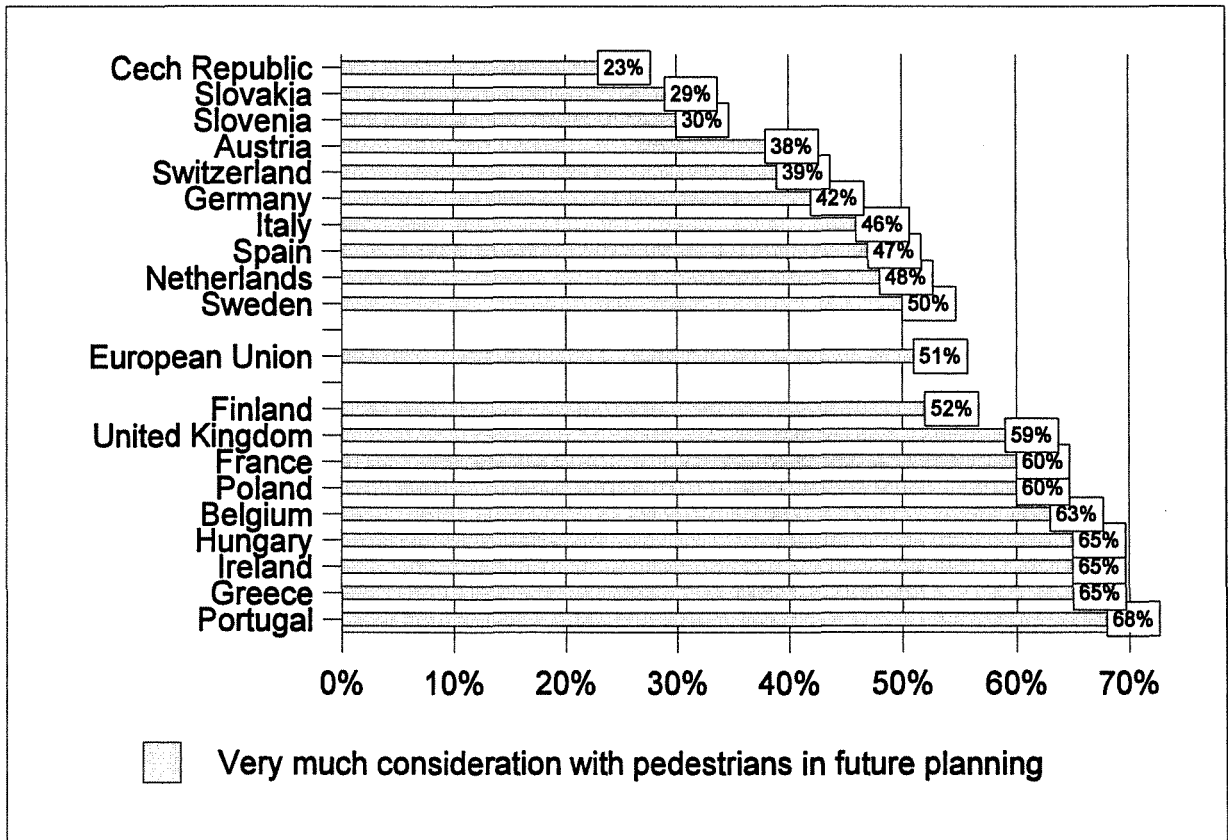


Figure 2.4. Opinion on amount of consideration to be given to pedestrians in future planning.



## 2.6. Telematics

Telematics - the combination of telecommunication, electronics and information sciences - is an umbrella concept covering new technological developments that ease or guide interactions between humans, machines and environment through new information systems. The applications in this field for a better and safer traffic system seem numerous. The future role of telematics in national and international traffic partly depends on how road users think about these new technological applications. In the SARTRE 2 questionnaire, the respondents were asked how useful they would find it for themselves to have new technological appliances in their car (Questions 31a to 31e). Their opinion was asked on the usefulness of the following five devices: a route guidance system, a device that helps not to exceed the speed limit, a distance control device, an alcohol-meter and a mobile telephone. *Table 2.8* describes the results for these questions.

### *General findings*

In 1996, the most appreciated telematics application in Europe is a distance control system. Two third among European drivers would find it very or fairly useful to have a distance control system in their cars. There are no large differences in European opinions about a distance control system. Over half of the European drivers would find it very or fairly useful to have a device that helps them to respect the speed limit or to have a device that guides them to their place of destination.

Opinion: Very/fairly useful to have on your car ...	Mean EU %
... a guidance system to find the way to destination	50%
... a device to assist you not to exceed the legal speed limit	57%
... a distance control system to maintain a safe distance automatic.	67%
... an alcohol-meter to check if you are over the legal limit	46%
... a mobile telephone	38%

*Table 2.8. Estimated personal usefulness of 'in car' devices (Questions 31a - 31e).*

The mobile telephone and the alcohol-meter come last as regards to judgments of usefulness. Over half of European drivers do not see any or much usefulness for themselves in having these devices in their car. Among the five devices, the mobile phone is, of course, the one device that is not directly connected with/developed for driving or road safety purposes.

### *Differences between countries*

The opinions about a distance control system, a guidance system and a device to assist not exceeding the speed limit did not show large variation. On the contrary, the opinions about the personal usefulness of the mobile telephone and the alcohol-meter are quite divided in Europe.

A closer look at the results concerning the mobile telephone reveals the following. Austrian, Dutch, French, German, Grecian and Spanish drivers all have large majorities who do not see any or much personal usefulness in

having a mobile phone in the car. Polish, Finnish, Italian, Swedish and Portuguese drivers make up majorities who estimate the mobile phone to be fairly of very useful for themselves. The particular publicity and cultural image surrounding the mobile telephone rather than driving or safety considerations probably determine the appraisal for this device in each European country.

The results concerning the alcohol-meter may elucidate further the European patterning in regard to drinking and driving. In *Figure 2.5* the results for the answer category 'No use at all' give the sharpest impressions of the differences.

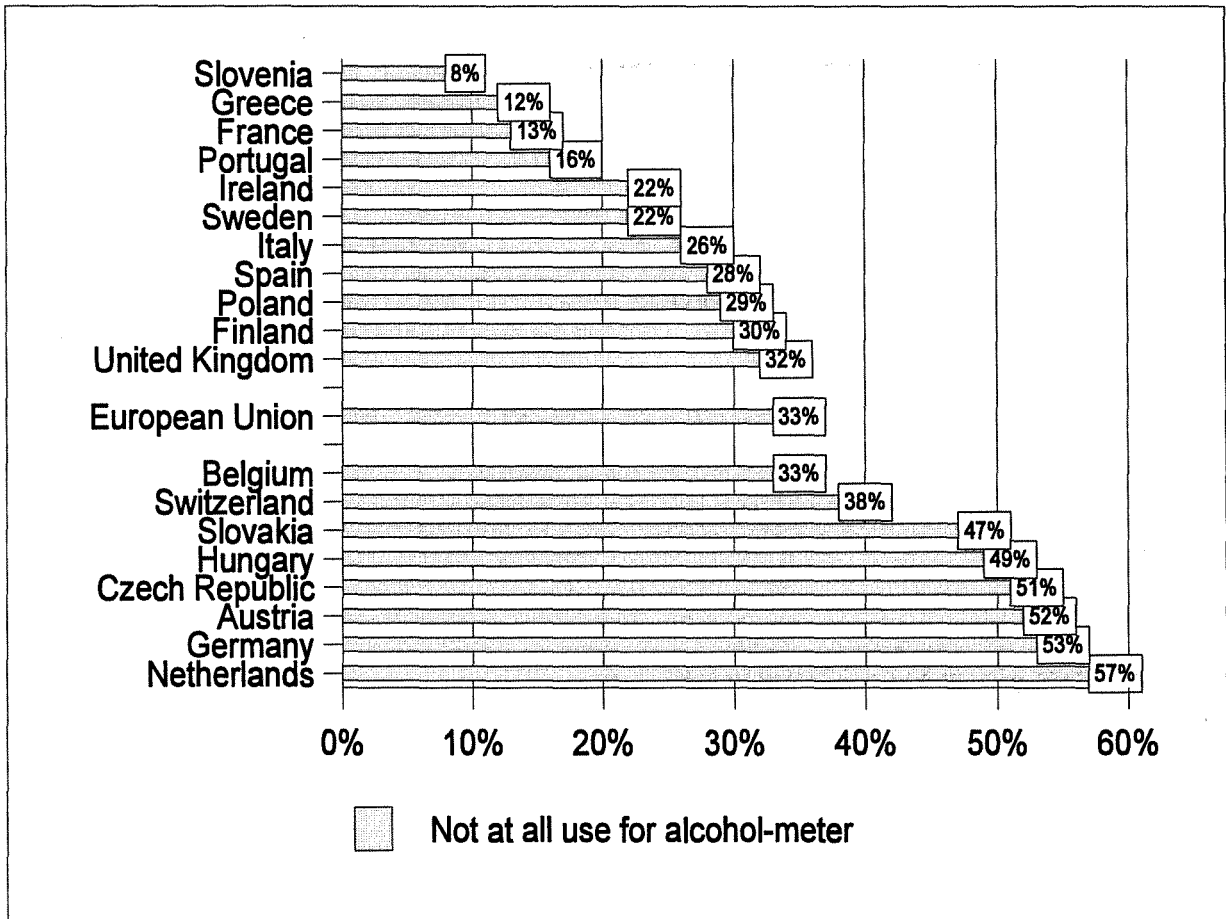


Figure 2.5. *Opinion on use for alcohol-meter.*

At first thought somewhat surprisingly, Grecian, French and Portuguese drivers who tend to be somewhat less disapproving of freedom of drinking-and-driving, have a majority who view use of the alcohol-meter as very or fairly useful to themselves. On the other hand, Dutch drivers who are among the most strict in Europe as regards freedom in drinking-and-driving, tend not see any or much personal usefulness in the alcohol-meter. And to further complicate the picture, Swedish drivers who share a strict attitude with the Dutch in regard to drinking-and-driving, tend to share their enthusiasm for the alcohol-meter with the Greece, French and Portuguese.

It may be that the drivers who do not see any or much personal usefulness in having an alcohol-meter, tend to rely on strict self-control to avoid drinking before driving and/or think they can establish quite well without any device whether they are over the legal alcohol limit. Strict self-control (or the preference for such control) and good working knowledge of the alcohol law may well be the main arguments for a reserved attitude towards the alcohol-meter.

Regarding European opinions on in-car devices, Austrian drivers draw our attention in their reserved attitude towards most of these devices. With the exception of a distance control system, Austrian drivers tend not to see any or much personal usefulness in having these devices in their cars. In the previous section we have noted that Austrian drivers may at the time - for whatever reason - be not interested so much in traffic issues, or to put it in other words: not be inspired very much by possibilities for future improvement. It may be that their reserved attitude towards in-car devices is yet another manifestation of this 'low interest/inspiration'.

## 2.7. General discussion

In 1996 there is large majority support among European drivers for road safety measures such as improvement of road standards, improvement of driver training, enforcement of traffic laws, testing of vehicles for safety, road safety campaigns, an European introduction of penalty points system and an European ban on alcohol for beginning drivers.

The introduction of a number of measures (e.g. penalty points system, installation of third braking light) on an European scale is also widely approved among European drivers. The approval for the European installation of a third braking light has increased greatly from minority support in 1991 to clear majority support in 1996. Presumably, the slowly increasing exposure to and (positive) experience with this device in daily traffic in the nineties has caused this considerable opinion shift.

The questions which show the largest variation between European countries pertain to the necessity of improving the standards of roads and to the strictness regarding drinking-and-driving. This result is in line with an earlier analysis of SARTRE 1 results, in which it was found that these questions were part of the two major discriminating dimensions between European countries.

Especially the findings concerning drinking-and-driving present a complex picture of differing attitudes. Drivers of southern European countries are, on the one hand, less extreme in their disapproval of freedom in drinking-and-driving and, on the other hand, very extreme in their thinking that drinking-and-driving will lead to accidents and that drinking-and-driving should be completely forbidden for young drivers. This answer pattern may indicate a tendency of southern European drivers to view the problem of drinking-and-driving as the particular problem of certain target groups (e.g. young people, or people with anti-social tendencies) and to equate drinking-and-driving with 'drunk driving' or 'reckless, uncontrolled driving'. It may be that drivers of northern European countries are more inclined to view drinking-and-driving as a general societal phenomenon and to have a more legalistic concept of drinking-and-driving, i.e. to see drinking-and-driving as driving with BAC

above the legal limit. In chapter 3, dealing with drinking-and-driving this issue is discussed in more detail.

#### *Changes between SARTRE 1 and SARTRE 2*

In Europe in general there are only a few large changes from 1991 to 1996 in opinions about measures. Most changes for most countries were within the range of 3 to 4 percentage points. For most of the countries, the support has hardly changed from SARTRE 1 to SARTRE 2. Taking a look at results on a country basis reveals some large opinion changes for a number of countries.

From SARTRE 1 to SARTRE 2, most and largest changes in opinions about measures have occurred among Italian, Hungarian, Portuguese and Swiss drivers. The change of opinions among Swiss drivers is consistent in the sense that they are far less supportive of different road safety measures in SARTRE 2 than in SARTRE 1. Like the Swiss, the Portuguese appear also to be less supportive of a number of different measures in SARTRE 2 - with the exception of government devoting more attention to improving driver education which they favour more in 1996 than in 1991.

In contrast to the findings for the Swiss and Portuguese drivers, the shift of opinions among Hungarian and Italian drivers goes more in the direction of growing support for a number of measures. In SARTRE 2, Hungarian drivers are more supportive of road safety campaigns, and of testing of vehicles, are more in favour of the European introduction of penalty point system, and of an obligation that car manufacturers restrict speed of cars and are more critical in regard to freedom in drinking-and-driving. In SARTRE 2, Italian drivers are more supportive of enforcement of traffic laws, restriction on the freedom of car manufacturers to use speed in advertisements, the European introduction of a penalty point system and of a requirement that car manufacturers restrict the maximum speed of cars. On the other hand, in SARTRE 2, Italian drivers are less supportive of more severity in penalties and are less extreme in their disapproval of freedom in drinking and driving.

Finally, some national groups of drivers have rather unique positions on certain subjects.

Belgium is unique in its low approval for the European introduction of a penalty points system.

France is unique in its strong support for restricting the freedom for car manufacturers in using speed in car advertisement and in obliging car manufacturers to restrict the maximum speed of their cars.

Italian and Grecian drivers may have what we call a 'double norm' regarding drinking-and-driving: very strict when thinking about drinking-and-driving as problem of specific target groups or as cause of accidents, but less strict when thinking about general freedom in drinking-and-driving.

Swiss are rather unique in their meagre enthusiasm for measures on an European scale and in their decreasing support for a number of road safety measures.

The Netherlands has a relatively unique position on drinking-and-driving: very strict regarding freedom in drinking-and-driving, but at the same time Dutch drivers do not see much usefulness in an alcohol-meter.

Portugal is unique in its decreasing support for a number of measures.

Among Italian drivers there is increased support for a number of measures, but there is no increase in the strictness concerning penalties for traffic offenses and drinking-driving  
Austrians are relatively unique in their reservations towards in-car devices.

*Recommendations*

1. The trend of waning support for a number of different road safety measures in some European countries may indicate some saturation with the road safety problem in these countries. Especially in these countries (but also in others) effort should be put into devising innovative road safety campaigns that are able to renew (personal) interest in road safety topics. Preferably, mass-media communications should be locally supplemented with more personal forms of communication directed at specific target groups or at local regions.
2. In some European countries where the enthusiasm and support for a number of road safety measures has been greatly increased, there is good momentum for introducing and implementing a more active, new road safety policy.
3. European publicity about the dangers of drink-driving should tackle possible misperceptions that equate drinking-and-driving with drunk driving, or that reduce the drinking-and-driving problem to problem behaviour of specific target groups.
4. Future transport and traffic planning should explicitly take into account the fact that at least half of the European car drivers agree on the idea that very much consideration should be given to alternative modes of transport besides the car, i.e. walking, cycling and the use of public transport.

## 3. Results of in-depth analysis

### 3.1. Introduction

This chapter describes the results of an in-depth statistical analysis into the results of SARTRE 2, focusing on the differences of European car drivers in opinions and norms concerning road safety measures and in-car devices.

In the § 3.2 we will present a short description of the statistical method. In this paragraph we will also give some attention to the statistical program CANALS which was used to execute the statistical analysis. In § 3.3 we will describe the results of the analyses. Finally, § 3.4 gives a summary of the main findings and a general discussion of these findings.

An important aim of the SARTRE 2 survey is to assist European policy makers in their decision making about traffic legislation, measures and campaigns. The planning of an unified traffic policy and the attempt to harmonize traffic measures can benefit substantially from knowledge about how European car drivers differ and are similar to each other in their thinking about road safety measures. Therefore we need to understand how car drivers from different European countries compare with each other.

In this chapter we focus on the following research questions:

- a. What are the major dimensions along which differences in opinions concerning road safety measures may be ordered?
- b. How can we describe or interpret the dimensions along which European car drivers differ?
- c. Which groupings of European countries are similar or dissimilar on a particular dimension?
- d. Which countries occupy rather extreme (unique) positions on certain dimensions?

### 3.2. Method

To study the European differences in opinions about road safety measures, a non-linear canonical correlation analysis was used. In this paragraph we will briefly describe this analysis technique and the program CANALS which was used to perform the analysis. A more thorough discussion of the analysis technique is presented in SARTRE (1994b).

In this paragraph the use of some technical jargon can not be avoided. We follow the explanation of concepts in Van der Burg (1983) and in SPSS (1990). The presentation of the results in the next paragraph will be as non-technical as possible.

### *Canonical correlation analysis*

Canonical correlation analysis (hereafter abbreviated as CCA) can be applied when we are dealing with two sets of variables. Our research problem also involves two sets of variables. We seek to know how European car drivers differ from each other and are similar to each other on a number of questions concerning road safety measures. Thus the research problem may be framed as the study of the relationships between one set of variables indicating different nationalities and another set of variables indicating opinions, and norms concerning road safety measures. In essence, CCA is an exploratory technique. The primary aim of this technique is not to test any specific hypotheses, but to reduce the complexity of a large data set.

In CCA, a weighted sum of variables is constructed for each set of variables in such a way that these weighted sums have a maximum correlation. This maximum correlation is called the canonical correlation and the corresponding weighted sums are called the canonical variates. The variables in the analyses have correlations with the canonical variates, called 'canonical loadings. We may consider the canonical variates as dimensions underlying the differences between countries; the canonical loadings can be seen as coordinates or positions on these dimensions. In our interpretation of the results we rely on visual plots of these canonical loadings.

If we are not satisfied with a single pair of canonical variates, a second pair can be computed which has a maximal correlation after the effect of the first pair has been removed. This means that the second pair of variates is perpendicular to the first pair. The number of pairs is also called the number of dimensions because it gives the dimensionality of the canonical solution.

### *The software program CANALS*

Many scales in the SARTRE survey are not metric, or there may be some doubt as to their metric qualities. Therefore, in the case of the SARTRE data, an analysis program should be used which both:

1. Can handle variables of a non-metric nature, and
2. Can perform canonical correlation analysis.

### *The program CANALS fulfils these two criteria*

CANALS (see Gifi, 1990; Van der Burg, 1985; Van der Burg & De Leeuw, 1983, SPSS, 1990) can perform a non-linear canonical correlation analysis on data of different measurement levels (nominal, ordinal, numerical). CANALS has been called a non-linear technique because it uses non-linear transformations to re-scale variable values in order to maximize the canonical correlation between two sets of variables; CANALS (together with related programs like HOMALS for homogeneity analysis, PRINCALS for non-linear principal components analysis) has recently become part of the SAS and SPSS/PC software packages so that it is now widely available.

### *Design and interpretation of the analyses*

Before we take a closer look at the results, some preliminary remarks on our use of non-linear CCA are in order.

Firstly, in all analyses one set of variables consisted of variables indicating nationalities and a second set of variables consisted of a selected subset of questions concerning traffic. For each country, a dummy variable was created by coding all respondents from that country as '1' and all other respondents as '2'. In this way 19 dummy variables were created for 19

countries. Each dummy variable can be seen as the indicator of one nationality.

Secondly, in all analyses three dimensions were specified. This means that the analysis aims to reduce the international differences on multiple issues to three more general dimensions along which various national groups may differ.

Thirdly, the results of the analyses are based on a re-scaling of the original data. We specified an ordinal measurement level for all the selected questions. On the basis of this specification, the analysis program seeks to re-scale the original variable values so as to optimize the relationship between the two sets of variables. More relevant to our research questions, it may be stated that the re-scaling ensures an optimal discrimination between countries along the dimensions. In the technical *Appendix 1 to Appendix 3* the original variable values and the re-scaled values (called 'category quantifications' in the Appendix) are reported. For instance in *Appendix 1* concerning the results of the first analysis, we see that question 3b ('Do you agree or disagree with the following statement: people should be free to decide for themselves how much they can drink and drive' - Variable number 26 in the appendix) has the following original variable values: 1 (Strongly agree), 2 (Agree) and 3 (Neither agree nor disagree), 4 (Disagree) and 5 (Strongly disagree). The re-scaled values for this variable are respectively. -1.720, -1.720, -0.809, -0.809 and 0.820.

A last point of clarification concerns the interpretation of the results. As we have explained before, the variables in the analyses have correlations with the canonical variates, called 'canonical loadings'. We may consider these canonical variates as 'underlying dimensions' and the canonical loadings as coordinates or positions on these dimensions. In our interpretation of the results we rely on an inspection of graphical plots of these canonical loadings. As we will see in the next paragraph, these plots enable us to see very easily which countries lie close together on a dimension and which countries lie far apart, and moreover, which topics are involved in a dimension.

In order to give one example of an interpretation of such a plot, let's direct our attention to *Figure 3.1* where the countries and questions on the first two dimensions are positioned.

The general reference point in the figure is point (0,0). The correct interpretation of the figure requires that we know the direction of the range of scores for the variables. The range of scores for the questions is not the original range as coded by the interviewers, but a transformed range of scores as a result of the re-scaling done by our analysis program. In our interpretations of the results we have taken account of the re-scaled values of the variables. For the sake of readability we generally will not refer to these re-scaled values. The reader can implicitly infer from our interpretation the scale of the variables. Of course, the reader can always check upon the exact nature of the relevant variable values by consulting the Appendices.

In *Figure 3.1* we see for instance that the dummy-variable representing Greece (with values 1 = Grecian; 2 = non-Grecian) and question 3b concerning the freedom to decide to drink and drive (with re-scaled values -1.72 (Strongly agree), -1.72 (Agree), -0.809 (Neither agree nor disagree), -0.809 (Disagree) and 0.820 (Strongly disagree) are lying close together and



a distance away from the reference point. This means that there is a close relationship between those two variables in the sense that low values on one variable will tend to be associated with low values on the other. Specifically, being Grecian (low value 1 of the dummy-variable) tends to go together with agreeing (low values  $-1.72$ ) and not to go together with strongly disagreeing (high value  $0.82$ ).

If two variables lie far apart in a opposite direction, e.g. the dummy-variable representing Sweden and question concerning freedom in drinking and driving in *Figure 3.1*, then low values on one variable tend to be associated with high values on the other. Thus, being Swedish (the low value of the dummy variable) tends to go together with strongly disagreeing with freedom in drinking and driving (the high value of this question).

The further apart the variables lie from the zero-point either in opposite directions or in the same direction, the stronger the relationship between the variables will be.

The plots of canonical loadings show the differences and similarities between European drivers in a graphic, two-dimensional way. The extent of these differences is further clarified by providing the answer percentages of countries and questions that dominate the analysis dimensions. The plots show us the differences in countries in a spatial way; the tables give us an idea of the differences in percentages.

### 3.3. Results analysis all nineteen sample-countries

In the first analysis the first set of variables consisted of nineteen dummy-variables representing the nineteen countries in the SARTRE-survey (in alphabetical order): Austria, Belgium, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

The second set of variables was chosen from 25 questions which all concern personal opinions and norms regarding road safety measures (see *Table 3.1*).

For the analysis, 24 from the 25 questions in the table were chosen for inclusion in the second set. One of the 25 questions, question 27e pertaining to the special zero alcohol limit for young drivers, was left out of this analysis. This was done because three countries Czech Republic, Slovakia and Slovenia in fact have a zero limit for all car drivers so that question 27e could not be meaningfully asked in these countries. In these three codes a special code was filled in for all respondents for this particular question. Inclusion of this question together with the three countries in one analysis would completely distort the outcomes of the analysis, since one of the main dimensions of the analysis would then be the deviant and homogeneous answer pattern of these three countries on this particular question.

Questions 2a-2e: Opinions about government devoting more effort to certain road safety measures	2a improving driver training
	2b more enforcement of traffic laws
	2c more road safety campaigns
	2d test road worthiness of more vehicles
	2e improve the standards of roads
Questions 3a-3b: Personal norms concerning punishment, drinking and driving, freedom of car manufacturers and public transport	3a Penalties for driving offenses should be more severe
	3b People should be allowed to decide for themselves how much they can drink and drive
	3c Car manufacturers should not be allowed to stress the speed of their cars in their advertisement
	3d Better public transport is needed
Questions 5a-5b: Opinions about the extent of consideration to be given to different transport modes in future planning	5a pedestrians
	5b cyclists
	5c motorcyclist
	5d cars
	5e lorries
	5f public transport
Questions 27a-27b: Opinions about the European introduction of road safety measures	27a A penalty points system
	27b A requirement that manufacturers modify their vehicles to restrict their maximum speed
	27c Regular technical check-ups for all types of vehicle
	27d Installation of a third braking light
	27e Not allowing new drivers to drink any alcohol before driving
Questions 31a-31e: Estimates of the personal usefulness of several in-car devices	31a a guidance system to find the way of destination
	31b a device to assist you not to exceed the legal speed limit
	31c a distance control system to maintain a safe distance automatically
	31d an alcohol-meter to check if you are over the legal limit
	31e a mobile telephone

Table 3.1. *Questions in the SARTRE 2 survey selected for analysis.*

The canonical correlations for each of the three dimensions were respectively: 0.66, 0.60 and 0.56. The correlation for the third dimension is somewhat lower than for the first two dimensions, but high enough to warrant a closer look at the possible meaning of this dimension.

A plot of the main opposing countries and questions along the first two dimensions is given in *Figure 3.1*. We may remind you that the plot in *Figure 3.1* is a graphical display of the canonical loadings of the variables on the canonical variates of the first set (the countries - the canonical loadings are given in *Appendix 1*). This means simply that both countries and questions in the analysis are projected onto a two dimensional space in which the differences between countries is optimal.

Let's turn our attention to the interpretation of *Figure 3.1*. This figure shows that on the first horizontal dimension Switzerland, Germany, Sweden, Austria and Finland lie opposite and some distance removed from Poland, Hungary, and Czech Republic, with Switzerland and Poland at the far most

opposite ends of the dimension. The question with the highest loading on this dimension is question 2e ('How much effort should government devote to improvement of standards of roads?'). The opposite clusters of countries along the first dimension should be mainly understood in terms of diverging answers on this particular question (See *Table 3.2*).

The first dimension is very much dominated by a division of countries in terms of their need for improvement of the road system, with at one extreme Swiss drivers who profess relatively low need for improvement and at another extreme Polish drivers who profess a very high need.

Question 2e obviously dominates the division of countries along the first dimension, but there are two other questions that have moderate loadings on this dimension: question 2b ('Should government devote more attention to more enforcement of traffic laws?') and question 2d ('Should government devote more attention to testing of vehicles?'). *Table 3.2* shows that in general the same countries who compared to others are very strongly in favour of improvement of roads (Poland, Hungary, Czech Republic) are also more strongly in favour of more enforcement of traffic laws. The countries with a relatively low need for improvement of roads (Switzerland, Austria, Finland, Sweden) are relatively less in favour of more enforcement of traffic laws. In the same vein, countries who have a high need for improvement of roads (Switzerland, Finland, Sweden) tend to be less interested in government devoting more attention to testing of vehicles than countries with a high need for improvement (Hungary and Poland).

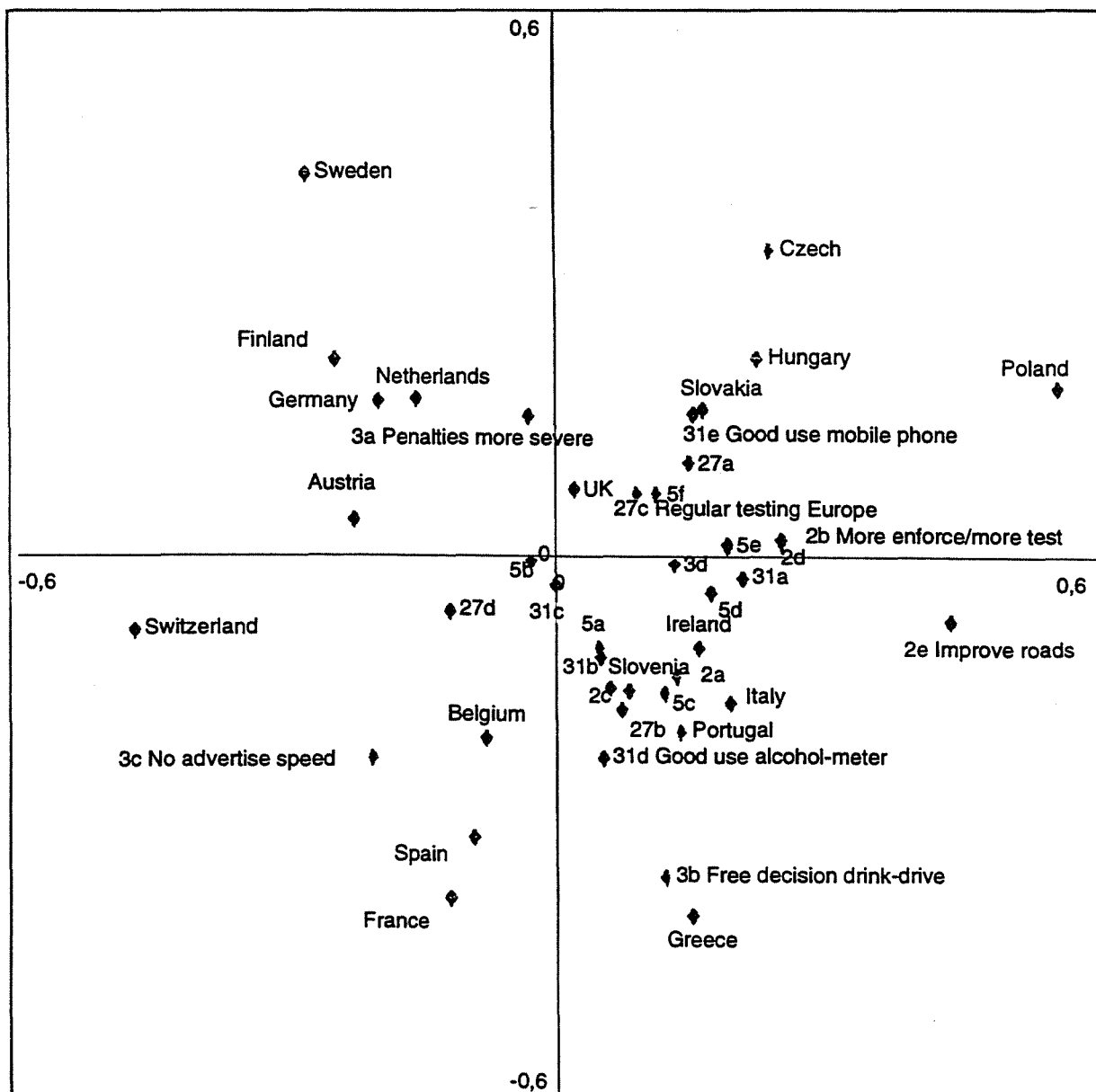


Figure 3.1. Horizontal: dimension 1, vertical: dimension 2.

In conclusion, the first dimension divides countries in terms of their need for improvement of roads, enforcement of traffic laws and testing of vehicles. The dimension is dominated by the division around the issue of improvement of roads and the somewhat smaller divisions around the issues of enforcement of traffic laws and testing of vehicles. There is a connection between these divisions in the sense that high need for improvement of roads tends to go along with relatively high need for enforcement of traffic laws and testing of vehicles.

Countries	Issues dividing countries along dimension 1		
	Main issue: Strongly favour improve standards roads	Secondary issue: Strongly favour more enforcement	Secondary issue: Strongly favour testing of more vehicles
Sweden	27%	11%	9%
<b>Switzerland</b>	19%	15%	10%
Finland	26%	15%	4%
Austria	35%	24%	25%
Versus			
<b>Poland</b>	85%	34%	44%
Czech Republic	72%	45%	17%
Hungary	81%	39%	32%

Table 3.2. *Main clusters of countries and opinion issues along the first dimension (countries with most extreme position on dimension marked bold).*

On the second vertical dimension in *Figure 3.1*, Greece, France and Spain lie a distance removed from Sweden, Czech Republic and Finland. The question with the highest loading on this dimension is question 3b (Agreement with statement: People should be free to decide for themselves how much they drink before driving). As can be seen in *Table 3.3*, Greece, France and Spain have a far smaller proportion of drivers who strongly disagree with this statement than Sweden, Czech Republic and Finland.

The questions 3c (Agreement with statement: Car manufacturers should not be allowed to mention speed in their advertisements) and 31d (Use for alcohol meter in car) have somewhat lesser loadings on the second dimension, but high enough to warrant a closer look at the differences between countries on these questions (see *Table 3.3*).

It appears that French and Spanish drivers who, compared to other European drivers, are less strict as regarding freedom in drinking and driving, are more willing to place restrictions on the freedom of car manufacturers to advertise with speed. On the other hand, Swedish and Czech drivers who very strongly disapprove of freedom of drinking and driving are not very much inclined to place restrictions on car manufacturers as to the contents of their car advertisements.

Maybe somewhat counterintuitive, the French and Grecian drivers who tend to be less strict as regards freedom in drinking and driving, do tend to evaluate the alcohol-meter as a useful personal device. The Czech drivers and Hungarian drivers, very disapproving of freedom in drinking and driving, tend to see very little personal usefulness in such a device.

In conclusion, the second dimension is mainly dominated by a division of countries in terms of their strictness as regards freedom of drinking and driving. Some smaller, concurrent divisions along this dimension have to do with opinions about the use of speed in car advertisements and the alcohol-meter. There are some (moderate) interrelations between these three issues to the extent that some of the countries who are relative less fierce in their disapproval of freedom in drinking and driving show relatively more disapproval of car manufacturers advertising with speed and more

enthusiasm about the usefulness of the alcohol-meter. At one extreme of the dimensions we find French drivers, who are less strict towards drinking and driving, more strict towards car manufacturers and relatively enthusiastic about the alcohol-meter; on the other end, we find Czech drivers, who are very strict towards freedom in drinking and driving, not enthusiastic about the alcohol-meter and less willing to interfere with freedom of car manufacturers to use speed.

Countries	Issues dividing countries along dimension 2.		
	Main issue: Strongly disagree with freedom drink-drive	Secondary issue: Strongly agree car manufacturers should not stress speed	Secondary issue: No use at all for the alcohol-meter
<b>Greece</b>	16%	11%	12%
France	41%	36%	13%
Spain	44%	22%	28%
Versus:			
<b>Sweden</b>	86%	5%	22%
<b>Czech Republic</b>	69%	3%	51%
Hungary	64%	5%	49%
Finland	93%	22%	30%

Table 3.3. *Main clusters of countries and opinion issues along the second dimension (countries with most extreme position on dimension marked bold).*

Figure 3.2 shows a plot of the canonical loadings in the space of the first and third dimension.

The issues dividing countries along the third dimension are: the usefulness of mobile telephone and the alcohol-meter and the European introduction of regular technical check-ups of all kinds of vehicles (see Table 3.4). German, Austrian, Slovakian and Czech drivers tend to agree with another that both the mobile telephone and the alcohol-meter are not very useful and with the exception of Czech drivers this group of drivers is also very in favour of an European introduction of technical check-up of all types of vehicles.

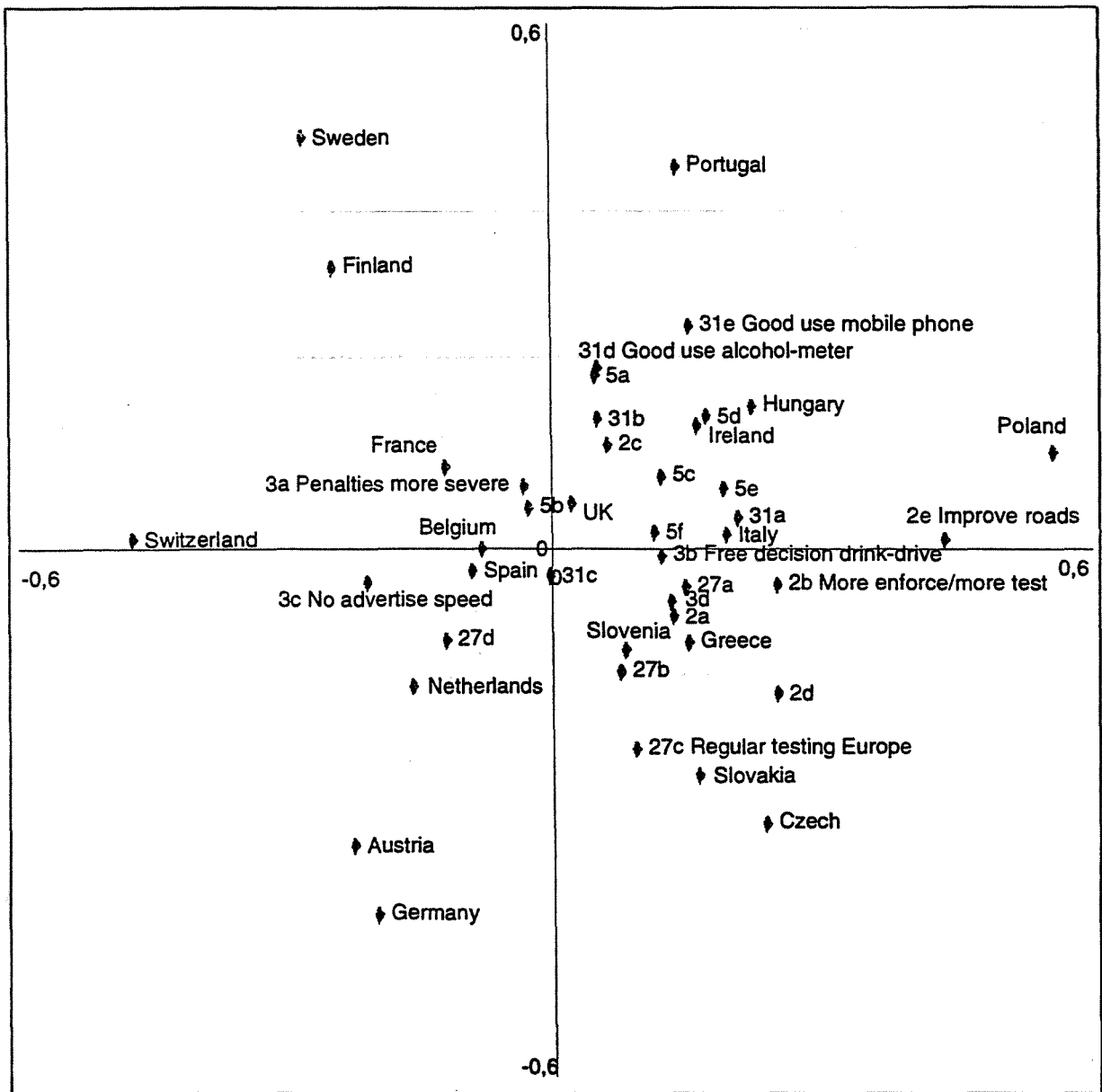


Figure 3.2. Horizontal: dimension 1, vertical: dimension 3.

Countries	Issues dividing countries along dimension 3		
	Main issue: No use at all for the mobile telephone	Secondary issue: No use at all for the alcohol-meter	Secondary issue: Very in favour of European introduction of technical check-ups
<b>Sweden</b>	17%	22%	25%
<b>Portugal</b>	22%	16%	15%
<b>Finland</b>	11%	30%	49%
Versus:			
<b>Germany</b>	50%	53%	65%
<b>Austria</b>	55%	52%	58%
<b>Czech Republic</b>	37%	51%	31%
<b>Slovakia</b>	32%	47%	87%

Table 3.4. *Main clusters of countries and opinion issues along the third dimension (countries with most extreme position on dimension marked bold).*

An opposing cluster of countries on the third dimension is formed by Sweden, Finland and Portugal. The Swedish, Finnish and Portuguese drivers tend to be somewhat more enthusiastic about the personal usefulness of the alcohol-meter and mobile telephone and, on the other hand, less enthusiastic about an European introduction of regular technical check-ups of all types of vehicles.

### 3.4. Results second analysis sixteen sample-countries

A second analysis was done with question 27e (Would you be in favour of the introduction of the following measures throughout European countries? Not allowing new drivers to drink any alcohol before driving?) included. Consequently, the three countries in which this question could not be meaningfully asked were left out of the analysis.

In this analysis, the first set of variables consisted of dummy-variables representing sixteen countries (in alphabetical order): Austria, Belgium, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Spain, Sweden, Switzerland and United Kingdom.

The second set of variables consisted of the 25 questions in *Table 3.1*. The canonical correlations for the three dimensions were respectively: 0.66, 0.62 and 0.57.

*Figure 3.3* shows the graphical display of the canonical loadings of the variables on the canonical variates of the first set. The canonical loadings are reported in *Appendix 2*.



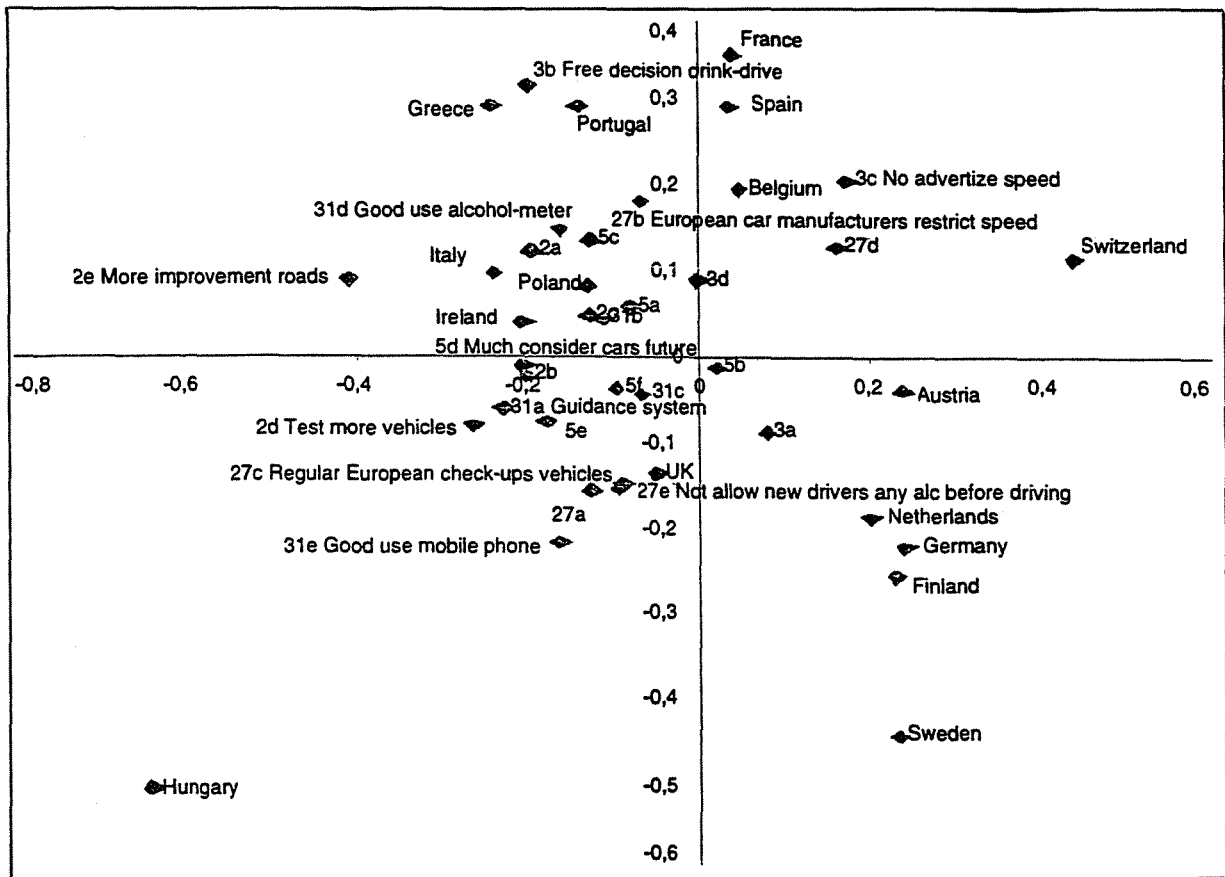


Figure 3.3. Horizontal: dimension 1, vertical: dimension 2.

As can be seen in Figure 3.3, Switzerland, Germany, Austria, Sweden and Finland are some distance removed from Hungary, Greece, Ireland and Italy. Again, as in the previous analysis, the question 2e has by far highest loading on this dimension, signifying that the differences between countries on this question in large part explain the meaning of this dimension. Besides question 2e, questions 2d (How much effort should government spend to testing of more vehicles?), 31a (Personal usefulness of guidance system) and 5d (How much consideration to cars in future planning) also have sizeable loadings on this dimension. Table 3.5 gives the answer percentages on the main dividing issues for the opposing clusters of countries.

Countries	Issues dividing countries along dimension 1			
	Main issue: Strongly in favour of Government devoting more effort to improving standards of roads	Secondary issue Strongly in favour of Government devoting more effort to testing road worthiness of more vehicles	Secondary issue: Not at all use for a guidance system to find the way to destination	Secondary issue: Very much consideration should be given to cars in future planning
<b>Switzerland</b>	19%	10%	35%	21%
Germany	37%	30%	35%	32%
Austria	35%	25%	46%	25%
Sweden	27%	9%	21%	31%
Finland	26%	4%	24%	38%
Versus:				
<b>Hungary</b>	81%	32%	21%	59%
Greece	64%	33%	23%	53%
Ireland	82%	37%	18%	64%
Italy	69%	25%	10%	43%

Table 3.5. Main clusters of countries and opinion issues along the first dimension (countries with most extreme position on dimension marked bold).

The Swiss, German, Austrian, Swedish and Finnish drivers tend to hold similar opinions on a number of issues. To summarize these opinions: relatively low interest in or need for improvement of roads and more testing of vehicles, reserved attitude towards personal usefulness of an in-car guidance system and moderate support only for giving much consideration to cars in planning for the future.

The mirror-image of this answer pattern is shown by the answers of the Hungarian, Grecian, Irish and Italian drivers (see Table 3.5). To summarize the general trend of opinions of these drivers: very high support for improvement of roads and more than moderate support for testing of more vehicles, relative more enthusiasm about an in-car guidance device and large support for giving very much consideration to cars in planning for the future.

Turning our attention to the second dimension of Figure 3.3, we see Hungary and Sweden lying far apart from France, Greece, Portugal and Spain. As in the previous analysis, question 3b (Agreement with statement that people should be free in deciding for themselves how much they drink before driving) has the highest loading on this dimension.

Further questions that have sizeable loadings on this dimension are question 31e (personal usefulness of the mobile telephone) and 3b (Agreement with statement that car manufacturers should not be allowed to use speed in their car advertisements). The meaning of this dimension should in large part be explained by differences on these three questions (see Table 3.6).

Countries	Issues dividing countries along dimension 2		
	Main issue: Strongly disagree with statement that people should be free to decide for themselves how much they drink before driving	Secondary issue: No use at all for the mobile telephone	Secondary issue: Strongly agree with the statement that car manufacturers should not be allowed to stress the speed of cars in their advertisement
<b>Hungary</b>	64%	18%	5%
<b>Sweden</b>	85%	17%	5%
Versus:			
<b>France</b>	41%	51%	36%
Greece	16%	50%	11%
Portugal	41%	22%	4%
Spain	44%	47%	22%

Table 3.6. Main clusters of countries and opinion issues along the second dimension (countries with most extreme position on dimension marked bold).

Hungarian and Swedish drivers have similar opinions in the sense that they strongly disapprove of freedom in drinking and driving, are not willing to place restrictions on the freedom of car manufacturers to use speed in their car advertisements and are enthusiastic about the personal usefulness of the mobile telephone.

The French, Grecian, Portuguese and Spanish drivers tend to 'flock together' in the sense that they are less severe in their disapproval of freedom in drinking and driving, are far less enthusiastic about the personal usefulness of the mobile telephone and are somewhat more willing to curtail the freedom of car manufacturers to use speed in their advertisements.

Figure 3.4 shows the graphical display of the canonical loadings of the variables on the first and third dimension (canonical variates of the first set). The differences between countries and the issues at stake on this dimension are almost the same as in our earlier analysis. Again we find the cluster of Swedish, Finnish and Portuguese drivers being relatively enthusiastic about the mobile telephone (and the alcohol-meter) and relatively reserved about regular testing of vehicles (on a national or European scale). Again, as before, we find German and Austrian drivers expressing the opposite pattern of opinions.

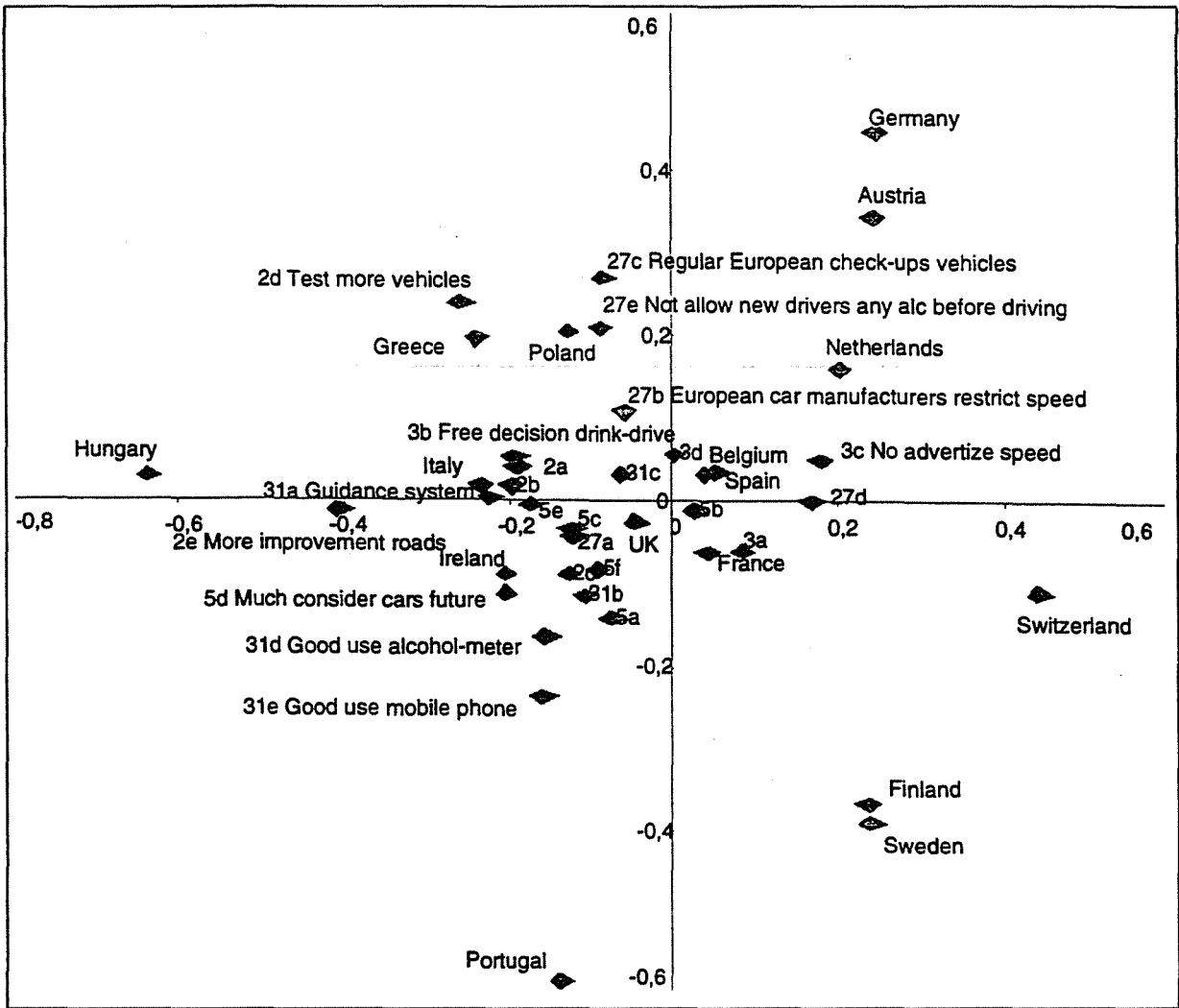


Figure 3.4. Horizontal: dimension 1, vertical: dimension 3.

Countries	Issues dividing countries along dimension 3.		
	Main issue: Very much in favour of European introduction of regular technical check-ups for all types of vehicles	Secondary issue: Strongly favour Government devoting more effort to testing roadworthiness more vehicles	Secondary issue: No use at all for the mobile telephone
<b>Germany</b>	65%	30%	50%
<b>Austria</b>	58%	25%	55%
Versus:			
<b>Portugal</b>	15%	9%	22%
<b>Sweden</b>	25%	9%	17%
<b>Finland</b>	49%	4%	11%

Table 3.7. Main clusters of countries and opinion issues along the third dimension (countries with most extreme position on dimension marked bold).

### 3.5. Results analysis 13 EU-countries

In the EU-only analysis the first set of variables consisted of dummy-variables representing the thirteen EU-countries (in alphabetical order): Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, and United Kingdom.

The second set of variables consisted of the 25 questions that were used in the analysis. The canonical correlations for the three dimensions were respectively: 0.66, 0.60 and 0.52.

*Figure 3.5* shows a graphical display of the canonical loadings on the canonical variates of the first set. The canonical loadings are reported in *Appendix 3*.

As can be seen in this figure, on the first horizontal dimension Greece, Italy, Portugal and France lie some distance away from Sweden, Finland, Germany and Netherlands. There are two questions that have high loadings on this dimension: question 3b (Agreement with statement: People should be free to decide for themselves how much they drink before driving) and question 2e (How much effort should government devote to improving the standards of roads?).

One cluster of countries (Sweden, Finland, Germany and Netherlands) is very strong in its disapproval of personal freedom in drinking and driving and tends not to be so strongly in favour of improvement of roads (see *Table 3.8*). Another cluster of EU-countries (Greece, Italy, Portugal, Spain) tends to be less strict in regard to drinking and driving and is more strongly in favour of the government spending more effort in improving standards of roads.

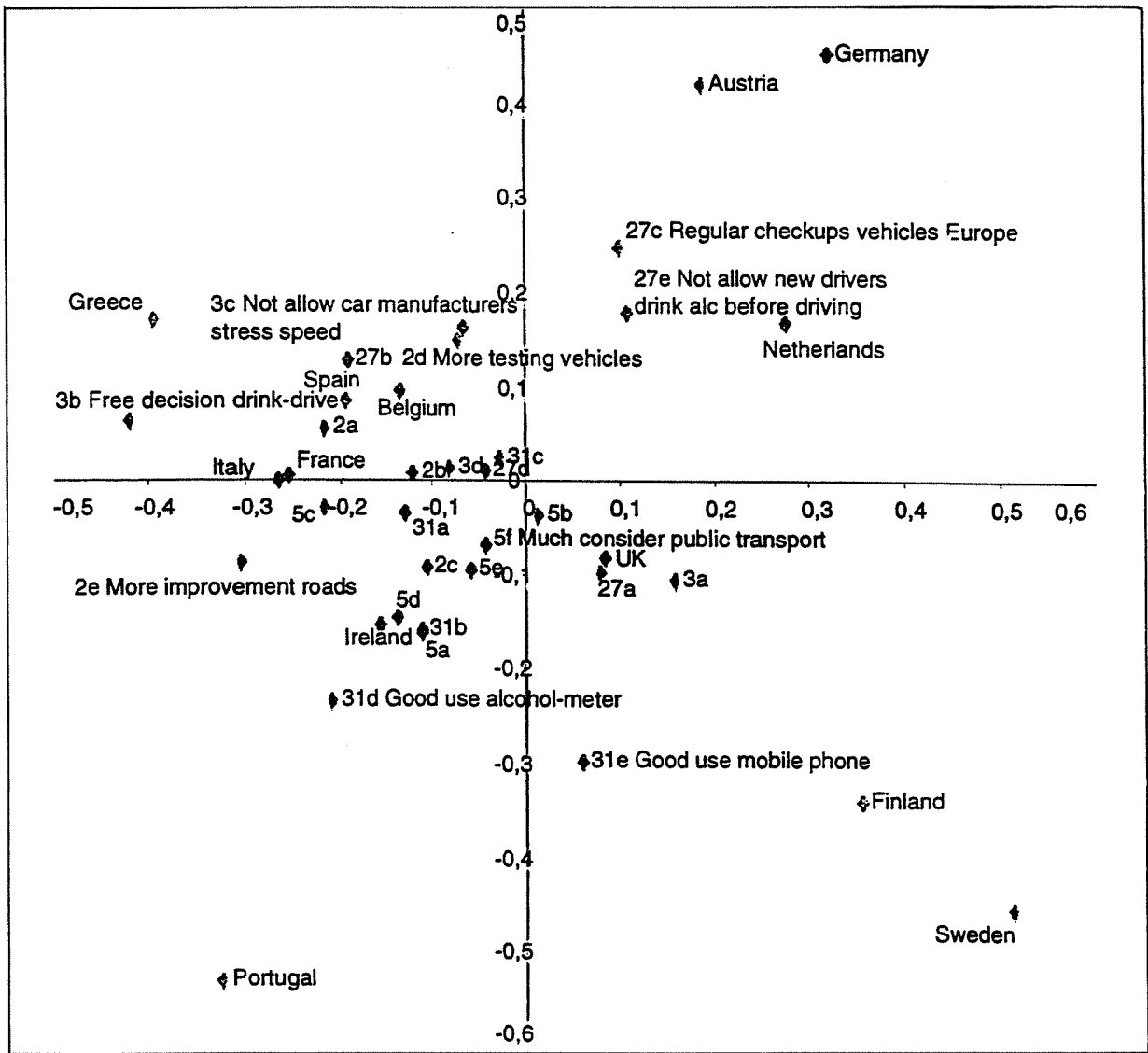


Figure 3.5. Horizontal: dimension 1, vertical: dimension 2.

Countries	Issues dividing EU-countries along dimension 1	
	Main issue: Strongly disagree with freedom drink-drive	Secondary issue: Strongly agree improve standards roads
<b>Greece</b>	16%	64%
<b>Portugal</b>	41%	72%
<b>Italy</b>	24%	68%
<b>France</b>	41%	45%
Versus:		
<b>Sweden</b>	86%	27%
<b>Finland</b>	93%	26%
<b>Germany</b>	63%	37%
<b>Netherlands</b>	75%	22%

Table 3.8. Main clusters of countries and opinion issues along the first dimension (countries with most extreme position on dimension marked bold).

If we take a look at the second vertical dimension in *Figure 3.5*, we see that Portugal, Sweden and Finland are far removed from Austria and Germany on this dimension. The questions with highest loadings on this dimension are: question 31e (personal usefulness of mobile telephone), question 31d (personal usefulness of alcohol-meter) and question 27c (European introduction of technical check-ups of vehicles).

Austrian and German drivers tend to be reserved in their judgments about the personal usefulness of both the mobile telephone and the alcohol-meter and are very strongly in favour of an European introduction of technical check-up of vehicles. On the other end of this dimension, Portuguese, Swedish and Finnish drivers show a mirror-opposite answer pattern, with more enthusiasm for both the mobile telephone and the alcohol-meter and less preference for the European introduction of technical check-up on vehicles.

Countries	Issues dividing EU-countries along dimension 2		
	Main issue: No use at all for mobile telephone	Secondary issue: Very in favour of European regular check-ups	Secondary issue: Very much use for alcohol-meter
<b>Portugal</b>	22%	15%	21%
Sweden	17%	25%	33%
Finland	11%	49%	28%
Versus:			
<b>Germany</b>	50%	65%	10%
<b>Austria</b>	55%	58%	9%

Table 3.9. *Main clusters of countries and opinion issues along the second dimension (countries with most extreme position on dimension marked bold).*

The pattern of differences along the second dimension in this analysis is the same as the pattern of differences along the third dimension in our earlier analyses.

*Figure 3.6* describes the first and third dimension. On the third dimension France, Belgium, Finland and Spain lie far removed from Italy and UK. Two questions have sizeable loadings on this dimension: question 2d (How much effort should government devote to increasing technical check-ups?) and 5f (When planning for the future how much consideration should be given to public transport?). In interpreting this dimension we should focus on the differences on these questions (see *Table 3.10*).

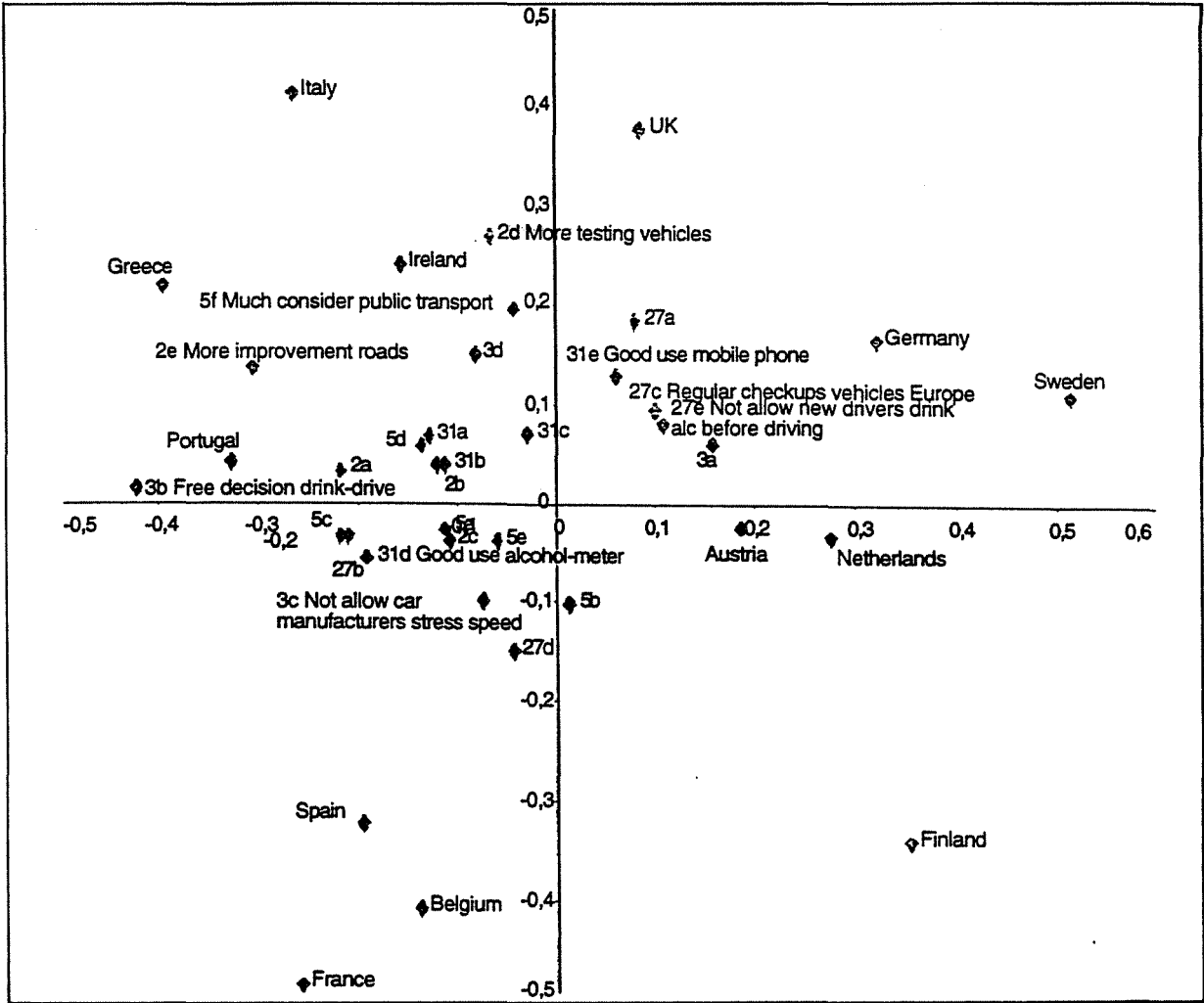


Figure 3.6. Horizontal: dimension 1, vertical: dimension 3.

Countries	Issues dividing EU-countries along dimension 3		
	Main issue: (Strongly) favour Government devoting more effort to testing more vehicles	Secondary issue: Very much consideration to public transport in future planning	Secondary issue: Very much in favour of European introduction of penalty points system
<b>France</b>	43%	42%	20%
<b>Belgium</b>	59%	45%	20%
<b>Finland</b>	24%	39%	34%
<b>Spain</b>	54%	38%	31%
Versus:			
<b>Italy</b>	74%	71%	36%
<b>UK</b>	82%	66%	36%
<b>Ireland</b>	82%	71%	37%
<b>Greece</b>	88%	58%	39%

Table 3.10. Main clusters of countries and opinion issues along the third dimension (countries with most extreme position on dimension marked bold).



The cluster of French, Belgian, Finnish and Spanish drivers tends to be only moderately in favour of government spending more effort in organizing more technical check-ups and tends to be only moderately in favour of giving very much consideration to public transport in planning for the future. Drivers from UK, Italy, Ireland and Greece show an opposite pattern of answers, being more strongly in favour of government undertaking action to test more vehicles and being strongly in favour of giving very much consideration to public transport in our plans for the future.

### 3.6. General discussion

In this chapter results were presented concerning European patterns of differences in opinions and norms regarding road safety measures and in-car devices. It's important to realize that not all important differences between countries are covered within this chapter. The patterns reviewed in this chapter mainly involved two clusters of two to four countries that had diverging views on two or three subjects. The present analysis has given us some insight into question which groups of national drivers tend to have similar opinions on a number of issues. This chapter and this discussion give us a broad view on European differences and similarities about road safety.

In the presentation of the results we have focused on the issues that gave rise to patterns of differences in opinion rather than the issues which did not evoke such patterns. It's now time to give a more balanced view of the total results. A number of question was not (or not very much) involved in the patterning of European differences. These questions dealt with the following issues:

- government should improve driver training;
- government should stimulate more road safety campaigns;
- penalties for traffic offences should be more severe;
- better public transport is needed;
- when planning for the future much consideration should be given to pedestrians;
- when planning for the future much consideration should be given to cyclists;
- when planning for the future much consideration should be given to motorcyclists;
- when planning for the future much consideration should be given to cars;
- when planning for the future much consideration should be given to lorries;
- European obligation to install third braking light;
- not allow new drivers in Europe to drink before driving;
- a device to assist you not to exceed the speed limit;
- a distance control system.

It goes too far to say that there is a European consensus on these issues. But in terms of size of differences and the number of diverging countries involved we may say that these issues constitute the least controversial. If policy makers strive for a multi-point programme for a European road safety policy some of the issues just mentioned, may be the best candidates for reaching a strong overall European public support.

Surprisingly, nearly all the questions dealing with the amount of consideration to be given to different modes of transport are not among the issues that divide European drivers. This is a surprise since we know that the

economic and social problems with transportation are indeed different in European countries. The format of these questions does not require the respondents to make a choice between priorities given to transport mode. For instance, the respondent may answer that very much consideration should be given to cars as well to cyclists or lorries. It may well be that stronger international differences may arise if drivers would be obliged to make a choice between priorities given to these transport modes. If another SARTRE survey will be held in the future, this is certainly a point for reflection.

If we turn our attention once more to European patterns of opinion differences, two issues stand out most clearly: the different personal norms in regard to personal freedom in drinking and driving and the different personal opinions on the need for improvement of roads. This finding in fact replicates the outcomes of an earlier analysis of opinion differences in Europe, where it was found that these two issues dominated the dimensions along which countries could be ordered (SARTRE, 1994b).

Within EU member states, the opinions on these two issues tend to differ along a North-South line. Drivers of rather Northerly located EU-states (Sweden, Finland, Germany, Netherlands, Austria) tend to completely reject any personal freedom in drinking and driving and, at the same time, are not so much in favour of their government undertaking more action to improve the standards of roads. On the other hand, drivers of Southerly located EU-states (Italy, Greece, Portugal, Spain) are far more lenient in regard to personal freedom in drinking and driving and are more in favour of government taking steps to improve the standards of roads.

Thus, within EU the opinions on these two issues tend to go together. However, presumably the mental frame that guides these opinions is very different in each case. Very likely, the opinions about the need for government to improve the standards of roads are a reflection of objective road conditions. Indeed, Northern countries like Sweden, Finland, Germany, Netherlands have a high quality road system. The drivers in these countries recognize this high quality and as a result will be less enthusiastic about their governments devoting much effort into even further improvement. The Grecian, Portuguese, Spanish and Italian drivers may have some less enchanting experiences with some of their roads and therefore be more inclined to encourage government to undertake more effort in this direction.

The mental frame for the opinions about freedom in drinking and driving derives from a whole different sphere of public life, presumably from more general societal norms regarding drinking of alcohol and personal autonomy. One well-known social-cultural phenomenon is that consumption of alcohol in southern (wine-drinking) European countries is part of a more relaxed lifestyle where alcohol consumption is a natural element of everyday meals. In the northern European countries, drinking constitutes a more secluded activity separated from the sphere of everyday life, and done more exclusively for its own purpose.

These differences in drinking culture may affect how people react to information about the hazards of combining alcohol with driving a car. If alcohol intake is regarded as a normal part of a daily lifestyle, then general notions or warnings about the health or safety risks of alcohol may not be taken seriously, or be particularized to fit only certain problem groups (e.g.

young people) instead of the general citizenry. Such a kind of thinking may explain why drivers of southern European countries far more lenient than drivers in Northern countries in regard to personal freedom in drinking and driving, but tend to be as strict as their Northern counterparts if it comes to the issue of a total alcohol ban for young drivers. It seems to be that the general leniency towards drinking and driving tends to disappear when thinking about the alcohol problem is particularized in the direction of special road user groups.

In the EU, leniency towards drinking and driving and high preference need for improvement of roads tend to go together. That this is no intrinsic connection becomes clear when we take into account the results for the non-EU East-European countries. In these countries we find both a low leniency towards drinking and driving and a strong call for improvement of the roads.

Besides, the major issues of improvement of roads and personal freedom in drinking and driving, there is a number of secondary issues on which groups of European drivers tend to disagree in a cluster-like way. These issues are:

- personal usefulness of the mobile telephone;
- personal usefulness of the alcohol-meter;
- the regular testing of vehicles (in Europe);
- the degree of attention to be given to cars in plans for the future;
- the introduction a penalty points system.

The results indicate that the car drivers who tend to agree with one another on the two mentioned major issues, are divided amongst themselves by a number of these minor issues. For instance, let's take the general cluster of Southern EU car drivers who tend to agree with one another in being more lenient towards drinking and driving. Among this cluster of drivers, there is dissension about the issues of regular European testing of vehicles, European introduction of a penalty points system and the need to consider public transport in future planning. Italy and Greece have a very strong preference that their governments undertake action to test more vehicles and that public transport is very much considered in the future and a moderate preference for the European introduction of a penalty points system. On the other hand, the French, Belgian and Spanish drivers tend to be decidedly less enthusiastic about all these measures. It may be that the lack of experience with measures of these type have led Italian and Hungarian drivers to expect very large benefits from them, whereas the experience with these measures in France, Belgium and Spain have led to somewhat more reserved and maybe more realistic down-to-earth attitudes.

Among the group of drivers who tend to agree on absolute rejection of freedom in drinking and driving, there is divergence on the issues of the usefulness of the mobile telephone and regular testing of vehicles. The Finnish and Swedish drivers tend to have far more appreciation for the mobile telephone and far less appreciation for regular testing of vehicles than the German, Austrian and Dutch drivers. It's easy to imagine how the remoteness of some of the Swedish and Finnish landscapes together with sometimes difficult weather conditions may have led to some enthusiasm for the availability of a mobile phone in the car.

## Literature

Burg, E. van der (1985). *CANALS; User's guide for Canals*. Department of Data Theory, University of Leiden, The Netherlands.

Burg, E. van der & Leeuw, J. de (1983). *Non-linear canonical correlation*. In: *British Journal of Mathematical and Statistical Psychology*, 36, p. 54-80.

Cauzard, J.-P. (1992a). *Maatschappelijke attitudes ten opzichte van verkeersrisico's. Methodological report; Part 3, Comparison of results country by country*. INRETS, Paris, France.

Cauzard, J.-P. (1992b). *Contribution to an exploratory analysis of the Sartre survey results*. INRETS, Paris, France.

Gifi, A. (1990). *Nonlinear Multivariate Analysis*. Wiley, Chichester.

Goldenbeld, Ch. (1994). *Differences and similarities between European drivers in opinions about traffic measures; A cross-national study of the results of the SARTRE survey*. Report R-94-9. SWOV Institute for Road Safety Research, Leidschendam, the Netherlands.

Goldenbeld, Ch. (1997). *Nederlandse rapportage SARTRE-2. Resultaten van de tweede enquête 'Social Attitudes to Road Traffic Risk in Europe' (SARTRE) uit 1996, vergeleken met de Nederlandse resultaten uit 1991 en met resultaten uit andere Europese landen (With summary in English)*. Report R-97-26. SWOV Institute for Road Safety Research, Leidschendam, the Netherlands.

INRETS, (1993). *SARTRE: Social Attitudes to Road Traffic Risk in Europe; Main Lines Report*. INRETS, Paris, France.

INRETS (1997). *SARTRE II bible; Version with 19 countries*. Internal report SARTRE-2 group. INRETS, Paris, France.

SARTRE (1994a). *European drivers and traffic safety*. Presses des Ponts et Chaussées, Paris, France.

SARTRE (1994b). *Social Attitudes to Road Traffic Risk in Europe. European drivers and traffic safety; In-depth analyses*. Presses des Ponts et Chaussées, Paris, France.

SARTRE group (1998a). *The attitude and behaviour of European car drivers to road safety; SARTRE 2 reports part 1. Report on principal results*. SWOV Institute for Road Safety Research, Leidschendam, the Netherlands.

SARTRE group (1998b). *The attitude and behaviour of European car drivers to road safety; SARTRE 2 reports part 2. Report on in-depth analyses*. SWOV Institute for Road Safety Research, Leidschendam, the Netherlands.

SARTRE steering committee (1998c). *The attitude and behaviour of European car drivers to road safety. Results, discussion and*

*recommendations for road safety policies drawn from SARTRE project.*  
*SARTRE 2 reports part 3. Executive summary.* SWOV Institute for Road  
Safety Research, Leidschendam, the Netherlands.

SPSS (1990). *SPSS Categories*. SPSS Inc, Chicago.



## Appendices 1-3

1. *Results analysis all countries*
2. *Results analysis*
3. *Results analysis EU-countries*





# Appendix 1 Results analysis all countries

## CANONICAL CORRELATIONS FOR EACH DIMENSION

(1)	(2)	(3)
0.657	0.597	0.558

## CORRELATIONS BETWEEN THE OPTIMALLY SCALED VARIABLES OF THE FIRST SET AND THE CANONICAL VARIATES OF THE FIRST SET FOR EACH DIMENSION

	1	2	3
1 Austria	-0.225	0.041	-0.334
2 Belgium	-0.080	-0.202	0.003
3 Finland	-0.247	0.216	0.318
4 France	-0.122	-0.378	0.096
5 Germany	-0.200	0.170	-0.411
6 Greece	0.151	-0.396	-0.104
7 Ireland	0.160	-0.099	0.141
8 Italy	0.192	-0.163	0.018
9 Netherlands	-0.157	0.173	-0.154
10 Portugal	0.139	-0.194	0.432
11 Spain	-0.091	-0.311	-0.023
12 Sweden	-0.281	0.424	0.463
13 United Kingdom	0.022	0.074	0.055
14 Czech republic	0.236	0.338	-0.306
15 Hungary	0.222	0.219	0.161
16 Poland	0.552	0.186	0.111
17 Slovakia	0.163	0.161	-0.255
18 Slovenia	0.081	-0.149	-0.112
19 Switzerland	-0.470	-0.083	0.011

## CORRELATIONS BETWEEN THE OPTIMALLY SCALED VARIABLES OF THE SECOND SET AND THE CANONICAL VARIATES OF THE FIRST SET FOR EACH DIMENSION

	1	2	3
20 2a improving driver training	0.134	-0.133	-0.074
21 2b more enforcement of traffic law	0.250	0.020	-0.037
22 2c more road safety campaigns	0.060	-0.145	0.119
23 2d test road worthiness of more vehicles	0.249	0.021	-0.163
24 2e improve the standards of roads	0.435	-0.071	0.013
25 3a Penalties for driving offenses should be more severe	-0.033	0.153	0.072
26 3b People be allowed to decide themselves how much they drink & drive	0.120	-0.353	-0.006
27 3c Not allow car manufacturers stress speed of cars in advertisement	-0.208	-0.223	-0.035
28 3d Better public transport is needed	0.133	-0.009	-0.058
29 5a Planning for the future pedestrians	0.049	-0.099	0.198
30 5b Planning for the future cyclists	-0.028	-0.007	0.050
31 5c Planning for the future motorcyclists	0.120	-0.152	0.083
32 5d Planning for the future cars	0.172	-0.041	0.152
33 5e Planning for the future lorries	0.190	0.015	0.071
34 5f Planning for the future public transport	0.111	0.068	0.019
35 27a A penalty points system	0.146	0.102	-0.040
36 27b A requirement that manufacturers modify cars to restrict max speed	0.074	-0.171	-0.135
37 27c Regular technical check-ups for all types of vehicle	0.091	0.067	-0.223
38 27d Installation of a third braking light	-0.121	-0.060	-0.100
39 31a a guidance system to find the way of destination	0.206	-0.023	0.038
40 31b a device to assist you not to exceed the legal speed limit	0.050	-0.110	0.147
41 31c a distance control system to maintain safe distance automatically	-0.003	-0.030	-0.028
42 31d an alcohol-meter to check if you are over the legal limit	0.052	-0.222	0.206
43 31e a mobile telephone	0.152	0.156	0.253

## CATEGORY QUANTIFICATIONS FIRST SET:

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 1 (NUMERICAL)

1	1005	-4.430
2	19720	0.226

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 2 (UMERICAL)

1	1003	-4.434
2	19722	0.226

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 3 (NUMERICAL)

1	1000	-4.441
2	19725	0.225

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 4 (NUMERICAL)

1	1011	-4.416
2	19714	0.226

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 5 (NUMERICAL)

1	1802	-3.241
2	18923	0.309

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 6 (NUMERICAL)

1	1009	-4.420
2	19716	0.226

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 7 (NUMERICAL)

1	1058	-4.311
2	19667	0.232

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 8 (NUMERICAL)

1	1136	-4.153
2	19589	0.241

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 9 (NUMERICAL)

1	1010	-4.418
2	19715	0.226

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 10 (NUMERICAL)

1	1103	-4.218
2	19622	0.237

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 11 (NUMERICAL)

1	1451	-3.645
2	19274	0.274

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 12 (NUMERICAL)

1	1003	-4.434
2	19722	0.226

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 13 (NUMERICAL)

1	1029	-4.375
2	19696	0.229

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 14 (NUMERICAL)

1	1000	-4.441
2	19725	0.225

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 15 (NUMERICAL)

1	1000	-4.441
2	19725	0.225

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 16 (NUMERICAL)

1	1040	-4.351
2	19685	0.230

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 17 (NUMERICAL)

1	1003	-4.434
2	19722	0.226

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 18 (NUMERICAL)

1	1062	-4.303
2	19663	0.232

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 19 (NUMERICAL)

1	1000	-4.441
2	19725	0.225

**CATEGORY QUANTIFICATIONS SECOND SET:**

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
20  
(ORDINAL)

1	6807	-0.869
2	9100	0.099
3	3477	1.027
4	850	1.027
5	281	1.603

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
21  
(ORDINAL)

1	6078	-0.717
2	8768	-0.326
3	3638	0.799
4	1558	1.656
5	569	3.193

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
22  
(ORDINAL)

1	4835	-0.928
2	9537	-0.262
3	4453	0.874
4	1263	1.672
5	434	1.672

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
23  
(ORDINAL)

1	5102	-0.795
2	8102	-0.492
3	4421	0.824
4	2077	1.147
5	808	2.343

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
24  
(ORDINAL)

1	11461	-0.809
2	6573	0.628
3	2016	1.913
4	432	1.913
5	171	2.103

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
25  
(ORDINAL)

1	4498	-0.618
2	7072	-0.297
3	4337	0.017
4	3449	1.052
5	1139	1.524

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
26  
(ORDINAL)

1	826	-1.720
2	1871	-1.720
3	1143	-0.809
4	5040	-0.809
5	11655	0.820

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
27  
(ORDINAL)

1	2920	-1.296
2	4762	-0.435
3	5834	-0.127
4	4542	0.878
5	2185	0.878

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
28  
(ORDINAL)

1	8968	-0.252
2	8057	-0.039
3	2457	0.668
4	694	1.175
5	206	1.175

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
29  
(ORDINAL)

1	10369	-0.855
2	8474	0.621
3	1471	1.897
4	214	1.897

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
30  
(ORDINAL)

1	10422	-0.719
2	8520	0.562
3	1408	1.186
4	223	1.402

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
31  
(ORDINAL)

1	7236	-1.060
2	9601	0.301
3	3137	1.173
4	530	1.173

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
32  
(ORDINAL)

1	8233	-0.856
2	9803	0.290
3	2293	1.635
4	250	1.682

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
33  
(ORDINAL)

1	8463	-0.565
2	8658	0.139
3	2796	1.101
4	576	1.472

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
34  
(ORDINAL)

1	11315	-0.481
2	7143	0.551
3	1752	0.640
4	313	1.177

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
35  
(ORDINAL)

1	6601	-0.415
2	7307	0.114
3	3548	0.114
4	2755	0.682

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
36  
(ORDINAL)

1	4328	-0.579
2	5551	0.036
3	4978	0.036
4	5285	0.162

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
37  
(ORDINAL)

1	10245	-0.886
2	7196	0.857
3	2024	0.890
4	1041	0.890

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
38  
(ORDINAL)

1	5599	-0.515
2	6825	0.152
3	4729	0.152
4	2787	0.152

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
39  
(ORDINAL)

1	5005	-0.705
2	5614	-0.188
3	5055	0.465
4	4563	0.581

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
40  
(ORDINAL)

1	4493	-0.669
2	7140	-0.669
3	5152	0.711
4	3729	1.070

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
41  
(ORDINAL)

1	5889	-0.717
2	7934	0.201
3	4139	0.201
4	2507	0.696

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
42  
(ORDINAL)

1	4861	-0.892
2	4803	-0.892
3	3930	0.243
4	6809	1.081

CATEGORY NUMBERS,MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO  
43  
(ORDINAL)

1	4070	-1.348
2	4744	-0.766
3	4493	0.333
4	7141	1.022





## Appendix 2 Results analysis

### CANONICAL CORRELATIONS FOR EACH DIMENSION

(1)	(2)	(3)
0.660	0.617	0.566

### CORRELATIONS BETWEEN THE OPTIMALLY SCALED VARIABLES OF THE FIRST SET AND THE CANONICAL VARIATES OF THE FIRST SET FOR EACH DIMENSION

	1	2	3
1 Austria	0.233	-0.038	0.344
2 Belgium	0.045	0.198	0.038
3 Finland	0.225	-0.252	-0.361
4 France	0.033	0.354	-0.061
5 Germany	0.235	-0.218	0.448
6 Greece	-0.249	0.293	0.197
7 Ireland	-0.212	0.042	-0.088
8 Italy	-0.245	0.099	0.020
9 Netherlands	0.195	-0.185	0.163
10 Portugal	-0.147	0.292	-0.581
11 Spain	0.031	0.294	0.034
12 Sweden	0.228	-0.440	-0.386
13 United Kingdom	-0.055	-0.135	-0.023
14 Hungary	-0.644	-0.504	0.032
15 Poland	-0.137	0.084	0.207
16 Switzerland	0.430	0.115	-0.107

### CORRELATIONS BETWEEN THE OPTIMALLY SCALED VARIABLES OF THE SECOND SET AND THE CANONICAL VARIATES OF THE FIRST SET FOR EACH DIMENSION

	1	2	3
17 2a improving driver training	-0.200	0.125	0.043
18 2b more enforcement of traffic laws	-0.207	-0.020	0.021
19 2c more road safety campaigns	-0.135	0.051	-0.088
20 2d test road worthiness of more vehicle	-0.270	-0.077	0.241
21 2e improve the standards of roads	-0.415	0.092	-0.010
22 3a Penalties for driving offenses should be more severe	0.076	-0.085	-0.057
23 3b People be allowed to decide themselves how much they can drink & drive	-0.204	0.317	0.054
24 3c Not allow car manufacturers stress the speed in advertisement	0.169	0.209	0.051
25 3d Better public transport is needed	-0.006	0.091	0.058
26 5a Planning for the future pedestrians	-0.085	0.061	-0.139
27 5b Planning for the future cyclists	0.017	-0.010	-0.010
28 5c Planning for the future motorcyclist	-0.133	0.138	-0.031
29 5d Planning for the future cars	-0.212	-0.008	-0.110
30 5e Planning for the future lorries	-0.183	-0.074	-0.003
31 5f Planning for the future public transport	-0.101	-0.034	-0.081
32 27a A penalty points system	-0.132	-0.153	-0.040
33 27b A requirement manufacturers modify vehicles restrict max speed	-0.071	0.183	0.111
34 27c Regular technical check-ups for all types of vehicle	-0.095	-0.146	0.272
35 27d Installation of a third braking light	0.159	0.131	0.004
36 27e Not allowing new drivers to drink any alcohol before driving	-0.100	-0.150	0.211
37 31a a guidance system to find the way of destination	-0.233	-0.058	0.007
38 31b a device to assist you not to exceed the legal speed limit	-0.117	0.045	-0.114
39 31c a distance control system to maintain safe distance automatically	-0.072	-0.042	0.036
40 31d an alcohol-meter to check if you are over the legal limit	-0.167	0.150	-0.161
41 31e a mobile telephone	-0.169	-0.215	-0.236

## CATEGORY QUANTIFICATIONS FIRST SET:

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 1 (NUMERICAL)

1	1005	-4.078
2	16717	0.245

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 2 (NUMERICAL)

1	1003	-4.083
2	16719	0.245

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 3 (NUMERICAL)

1	1000	-4.089
2	16722	0.245

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 4 (NUMERICAL)

1	1011	-4.066
2	16711	0.246

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 5 (NUMERICAL)

1	1802	-2.972
2	15920	0.336

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 6 (NUMERICAL)

1	1009	-4.070
2	16713	0.246

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 7 (NUMERICAL)

1	1058	-3.969
2	16664	0.252

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 8 (NUMERICAL)

1	1136	-3.821
2	16586	0.262

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 9 (NUMERICAL)

1	1010	-4.068
2	16712	0.246

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 10 (NUMERICAL)

1	1103	-3.882
2	16619	0.258

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 11 (NUMERICAL)

1	1451	-3.349
2	16271	0.299

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 12 (NUMERICAL)

1	1003	-4.083
2	16719	0.245

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 13 (NUMERICAL)

1	1029	-4.028
2	16693	0.249

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 14 (NUMERICAL)

1	1040	-4.005
2	16682	0.250

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 15 (NUMERICAL)

1	1062	-3.961
2	16660	0.252

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 16 (NUMERICAL)

1	1000	-4.089
2	16722	0.245

### CATEGORY QUANTIFICATIONS SECOND SET:

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 17 (ORDINAL)

1	5840	-0.831
2	7759	-0.069
3	3077	1.365
4	672	1.365
5	232	1.365

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 18 (ORDINAL)

1	4768	-0.459
2	7480	-0.459
3	3358	0.527
4	1458	1.549
5	550	3.289

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 19 (ORDINAL)

1	4347	-0.658
2	8359	-0.353
3	3579	0.945
4	941	1.780
5	346	1.780

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 20 (ORDINAL)

1	4331	-1.090
2	6781	-0.402
3	3870	0.897
4	1830	1.305
5	745	1.899

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 21 (ORDINAL)

1	9092	-0.878
2	6015	0.555
3	1960	1.788
4	420	1.788
5	169	1.788

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 22 (ORDINAL)

1	3623	-0.827
2	6006	-0.409
3	3781	0.212
4	3055	1.189
5	1042	1.189

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 23 (ORDINAL)

1	745	-1.626
2	1720	-1.626
3	997	-0.779
4	4494	-0.779
5	9579	0.853

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 24 (ORDINAL)

1	2762	-1.038
2	4392	-0.216
3	5117	-0.041
4	3512	0.632
5	1536	0.632

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 25 (ORDINAL)

1	7425	-0.265
2	7056	0.110
3	2184	0.110
4	617	0.729
5	168	0.729

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 26 (ORDINAL)

1	9197	-0.764
2	6949	0.544
3	1225	2.022
4	184	2.022

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 27 (ORDINAL)

1	9055	-0.732
2	7125	0.618
3	1221	1.103
4	195	1.334

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 28 (ORDINAL)

1	6343	-1.009
2	8003	0.269
3	2698	1.158
4	485	1.158

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 29 (ORDINAL)

1	7071	-0.756
2	8301	0.219
3	2006	1.681
4	219	1.681

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 30 (ORDINAL)

1	7226	-0.583
2	7287	0.425
3	2478	0.508
4	530	0.521

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 31 (ORDINAL)

1	9509	-0.390
2	6159	0.261
3	1592	1.140
4	280	1.140

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 32 (ORDINAL)

1	5304	-0.227
2	6555	-0.227
3	3075	0.277
4	2354	0.959

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 33 (ORDINAL)

1	3777	-0.694
2	5070	-0.092
3	4274	0.000
4	4102	0.466

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 34 (ORDINAL)

1	8587	-0.891
2	6260	0.680
3	1811	1.008
4	877	1.690

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 35 (ORDINAL)

1	4606	-0.368
2	6191	0.033
3	4073	0.144
4	2227	0.144

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 36 (ORDINAL)

1	10556	-0.549
2	3498	0.333
3	1908	0.828
4	1387	1.660
5	0	0.000

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 37 (ORDINAL)

1	4248	-0.769
2	4863	-0.048
3	4289	0.480
4	3899	0.480

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 38 (ORDINAL)

1	3960	-0.618
2	6308	-0.618
3	4242	0.683
4	3031	1.097

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 39 (ORDINAL)

1	5186	-0.796
2	6880	0.304
3	3384	0.304
4	2057	0.485

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 40 (ORDINAL)

1	4439	-0.785
2	4337	-0.785
3	3270	0.135
4	5393	1.144

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 41 (ORDINAL)

1	3377	-1.429
2	4044	-0.740
3	3801	0.354
4	6271	0.995

## Appendix 3 Results analysis EU-countries

### CANONICAL CORRELATIONS FOR EACH DIMENSION

(1)	(2)	(3)
0.661	0.596	0.525

### CORRELATIONS BETWEEN THE OPTIMALLY SCALED VARIABLES OF THE FIRST SET AND THE CANONICAL VARIATES OF THE FIRST SET FOR EACH DIMENSION

	(1)	(2)	(3)
1 Austria	0.184	0.423	-0.021
2 Belgium	-0.139	0.099	-0.405
3 Finland	0.351	-0.336	-0.339
4 France	-0.258	0.008	-0.484
5 Germany	0.318	0.456	0.166
6 Greece	-0.396	0.172	0.219
7 Ireland	-0.159	-0.150	0.242
8 Italy	-0.267	0.004	0.413
9 Netherlands	0.272	0.171	-0.031
10 Portugal	-0.327	-0.528	0.043
11 Spain	-0.197	0.087	-0.321
12 Sweden	0.509	-0.452	0.111
13 United Kingdom	0.083	-0.080	0.379

### CORRELATIONS BETWEEN THE OPTIMALLY SCALED VARIABLES OF THE SECOND SET AND THE CANONICAL VARIATES OF THE FIRST SET FOR EACH DIMENSION

	(1)	(2)	(3)
14 2a improving driver training	-0.219	0.060	0.034
15 2b more enforcement of traffic laws	-0.125	0.010	0.041
16 2c more road safety campaigns	-0.109	-0.091	-0.037
17 2d test road worthiness of more vehicles	-0.070	0.166	0.271
18 2e improve the standards of roads	-0.307	-0.085	0.138
19 3a Penalties for driving offenses should be more severe	0.155	-0.102	0.064
20 3b People be allowed to decide how much they can drink and drive	-0.423	0.067	0.018
21 3c Not allow car manufacturers stress the speed of cars in advertisement	-0.076	0.152	-0.097
22 3d Better public transport is needed	-0.084	0.016	0.153
23 5a pedestrians	-0.115	-0.159	-0.024
24 5b cyclists	0.012	-0.034	-0.098
25 5c motorcyclist	-0.219	-0.027	-0.031
26 5d cars	-0.140	-0.144	0.060
27 5e lorries	-0.061	-0.093	-0.037
28 5f public transport	-0.045	-0.067	0.197
29 27a A penalty points system	0.078	-0.094	0.187
30 27b A requirement that manufacturers modify cars to restrict max speed	-0.194	0.130	-0.054
31 27c Regular technical check-ups for all types of vehicle	0.097	0.251	0.096
32 27d Installation of a third braking light	-0.045	0.015	-0.147
33 27e Not allowing new drivers to drink any alcohol before driving	0.105	0.180	0.082
34 31a a guidance system to find the way of destination	-0.133	-0.032	0.071
35 31b a device to assist you not to exceed the legal speed limit	-0.114	-0.156	0.041
36 31c a distance control system to aintain a safe distance automatically	-0.031	0.028	0.072
37 31d an alcohol-meter to check if you are over the legal limit	-0.212	-0.231	-0.032
38 31e a mobile telephone	0.058	-0.295	0.130

## CATEGORY QUANTIFICATIONS FIRST SET:

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 1 (NUMERICAL)

1	1005	-3.681
2	13615	0.272

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 2 (NUMERICAL)

1	1003	-3.685
2	13617	0.271

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 3 (NUMERICAL)

1	1000	-3.691
2	13620	0.271

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 4 (NUMERICAL)

1	1011	-3.669
2	13609	0.273

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 5 (NUMERICAL)

1	1802	-2.667
2	12818	0.375

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 6 (NUMERICAL)

1	1009	-3.673
2	13611	0.272

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 7 (NUMERICAL)

1	1058	-3.580
2	13562	0.279

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 8 (NUMERICAL)

1	1136	-3.445
2	13484	0.290

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 9 (NUMERICAL)

1	1010	-3.671
2	13610	0.272

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 10 (NUMERICAL)

1	1103	-3.501
2	13517	0.286

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 11 (NUMERICAL)

1	1451	-3.013
2	13169	0.332

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 12 (NUMERICAL)

1	1003	-3.685
2	13617	0.271



CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 13 (NUMERICAL)

1	1029	-3.634
2	13591	0.275

CATEGORY QUANTIFICATIONS SECOND SET:

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 14 (ORDINAL)

1	4758	-0.931
2	6499	0.085
3	2540	1.203
4	526	1.203
5	192	1.239

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 15 (ORDINAL)

1	3914	-0.718
2	6365	-0.273
3	2744	0.958
4	1125	0.958
5	385	2.673

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 16 (ORDINAL)

1	3611	-0.781
2	7068	-0.265
3	2905	0.983
4	694	1.844
5	223	1.844

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 17 (ORDINAL)

1	3378	-0.980
2	5607	-0.566
3	3405	0.809
4	1526	1.525
5	568	2.047

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 18 (ORDINAL)

1	7190	-0.919
2	5331	0.594
3	1613	1.662
4	315	1.662
5	115	1.662

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 19 (ORDINAL)

1	3077	-0.676
2	5204	-0.318
3	2940	-0.007
4	2484	1.127
5	737	1.833

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 20 (ORDINAL)

1	592	-1.566
2	1464	-1.566
3	674	-0.904
4	3625	-0.858
5	8109	0.845

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 21 (ORDINAL)

1	2424	-1.368
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2	3893	0.159
3	4107	0.184
4	2792	0.366
5	1154	0.366

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 22 (ORDINAL)

1	6439	-0.500
2	5787	-0.007
3	1548	1.159
4	499	1.975
5	141	1.975

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 23 (ORDINAL)

1	7825	-0.699
2	5604	0.478
3	924	2.384
4	144	2.384

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 24 (ORDINAL)

1	7617	-0.784
2	5792	0.604
3	956	1.755
4	160	2.899

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 25 (ORDINAL)

1	5428	-0.998
2	6612	0.285
3	2059	1.333
4	374	1.333

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 26 (ORDINAL)

1	5878	-0.789
2	7003	0.201
3	1495	1.902
4	161	1.902

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 27 (ORDINAL)

1	6009	-0.240
2	6154	-0.240
3	1901	1.066
4	405	2.363

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 28 (ORDINAL)

1	8082	-0.806
2	4999	0.960
3	1201	0.960
4	201	1.685

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 29 (ORDINAL)

1	4573	-0.450
2	5564	-0.450
3	2374	0.646
4	1791	1.537

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 30 (ORDINAL)

1	3334	-0.601
2	4282	-0.155
3	3437	-0.020
4	3183	0.567

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 31 (ORDINAL)

1	6886	-0.932
2	5447	0.707
3	1486	0.878
4	650	1.811

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 32 (ORDINAL)

1	3598	-0.740
2	5198	-0.219
3	3505	0.637
4	1849	0.783

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 33 (ORDINAL)

1	8612	-0.560
2	3047	0.382
3	1607	0.729
4	1066	1.621
5	0	0.000

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 34 (ORDINAL)

1	3172	-0.466
2	4001	-0.409
3	3721	0.460
4	3403	0.460

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 35 (ORDINAL)

1	3116	-0.688
2	5248	-0.688
3	3582	0.709
4	2536	1.195

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 36 (ORDINAL)

1	4003	-0.827
2	5750	0.266
3	2903	0.266
4	1797	0.592

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 37 (ORDINAL)

1	3314	-0.879
2	3639	-0.873
3	2821	0.265
4	4641	1.116

CATEGORY NUMBERS, MARGINAL FREQUENCIES AND CATEGORY QUANTIFICATIONS OF VARIABLE NO 38 (ORDINAL)

1	2512	-1.336
2	3390	-0.927
3	3123	0.263
4	5407	0.997