

Institute for Transport Studies

FACULTY OF ENVIRONMENT



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# Legislation has minimal impact on drivers' in-vehicle use of nomadic devices

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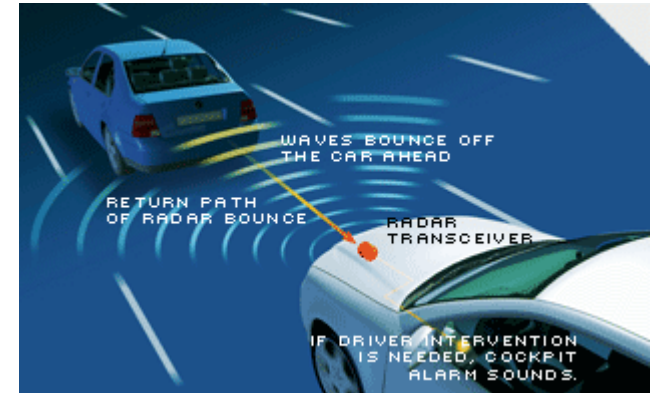
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# Safety research areas



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- Safety and human factors aspects of new technologies
  - Effects of automating the driving task on awareness & workload
  - Development and testing of systems that support driving – e.g. adaptive systems
- But also more “traditional” driving problems such as:
  - Drivers’ speed
  - Young (and elderly) drivers
  - Impairment (fatigue/alcohol)
  - Engineering solutions (Road layout and roadside features)



# The aim was.....



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- i. To assess the extent to which drivers use nomadic devices (NDs) whilst driving
- ii. Determine the legalities of their use by the drivers
- iii. Establish how the stringency of legislation relates to use
- iv. Enhance our knowledge as to the impact of various types of regulation, at least in terms of drivers' self-reported behavior.

# Research approaches



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- Laboratory studies



- Driving simulator studies



- Surveys



- Field Operational Tests (FOTs)



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# Country clustering



- 27 EU member states were qualitatively categorized based on their legislation relating to nomadic devices.
- The scope, level of detail and sanction levels present in each country were taken into account
- Establishing these clusters allowed the identification of near homogenous groups of countries. Five clusters were produced:

		<b>Scope</b>	<b>Level of detail</b>	<b>Sanction</b>
<b>Cluster A</b>	Italy	High	High	High
<b>Cluster B</b>	Spain	Highest	Medium	High
<b>Cluster C</b>	UK	Medium	Medium	Medium
<b>Cluster D</b>	Poland	Low	Medium	Medium
<b>Cluster E</b>	Sweden	Lowest	Low	Low

	Ranking scope	Ranking Level of Detail	Ranking Monetary Sanction	Cluster
EL	High	High	High	I
IT	High	High	High	
PT	High	High	High	
SI	High	High	High	
ES	Highest	Medium	High	II
FI	Highest	Medium	Medium	
DE	High	High	Low	
CH	High	Medium	Medium	
SK	High	Medium	Medium	
FR	High	Medium	Low	
LU	Medium	High	Medium	
CY	Medium	Medium	High	
NL	Medium	Medium	High	
AT	Medium	Medium	Medium	III
DK	Medium	Medium	Medium	
UK	Medium	Medium	Medium	
CZ	Medium	Medium	Low	
EE	Medium	Medium	Low	
MT	Medium	Medium	Low	
BE	Low	Medium	High	
LT	Low	High	Low	IV
IE	Low	Medium	Medium	
PL	Low	Medium	Medium	
BG	Low	Medium	Low	
HU	Low	Medium	Low	
IS	Low	Medium	Low	
LV	Low	Medium	Low	
RO	Low	Medium	Low	
SE	Lowest	Low	Low	V



Italy



Spain



UK



Poland



Sweden



# Survey participants



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- Participants were screened and only included if:
  - They were currently car drivers
  - They owned one or more of the NDs of interest
- Main survey carried out in the five cluster countries (IT, ES, UK, PL, SE)
- 300 respondents in each country
- NDs of interest were:
  - i. Mobile phones
  - ii. Personal navigation device (PND)
  - iii. Music player
  - iv. TV/DVD player



We aimed to model how:

- Age, Gender, Annual mileage, Country (and thus regulation)

predict:

- Propensity to own a Nomadic Device
- Propensity to use the Nomadic Device while driving
- “Normal use” as well as high-risk scenarios:
  - i. Personal Navigation Device: destination entry or change
  - ii. Mobile phone: texting
  - iii. Music player: changing tracks/artists
  - iv. TVs or DVD Players: having the screen visible while driving



# Creating the legislation clusters



- Needed to take the stringency of each country's legislation into account in the modelling, the countries were ranked - Table A.
- From the rankings, clusters were created, Table B. Although Italy was always placed in the most stringent category, for PNDs it was joined by Spain While Sweden was always in the least stringent category, it was joined by Poland for mobile phone and TV/DVD legislation.

(A)

	PND	Mobile phone	Music player	TV/DVD player	Average
Italy	1	1	1	1	1
Spain	1	3	2	2	2
UK	2	2	3	3	2.5
Poland	3	3	3	4	3.25
Sweden	3	4	3	4	3.5



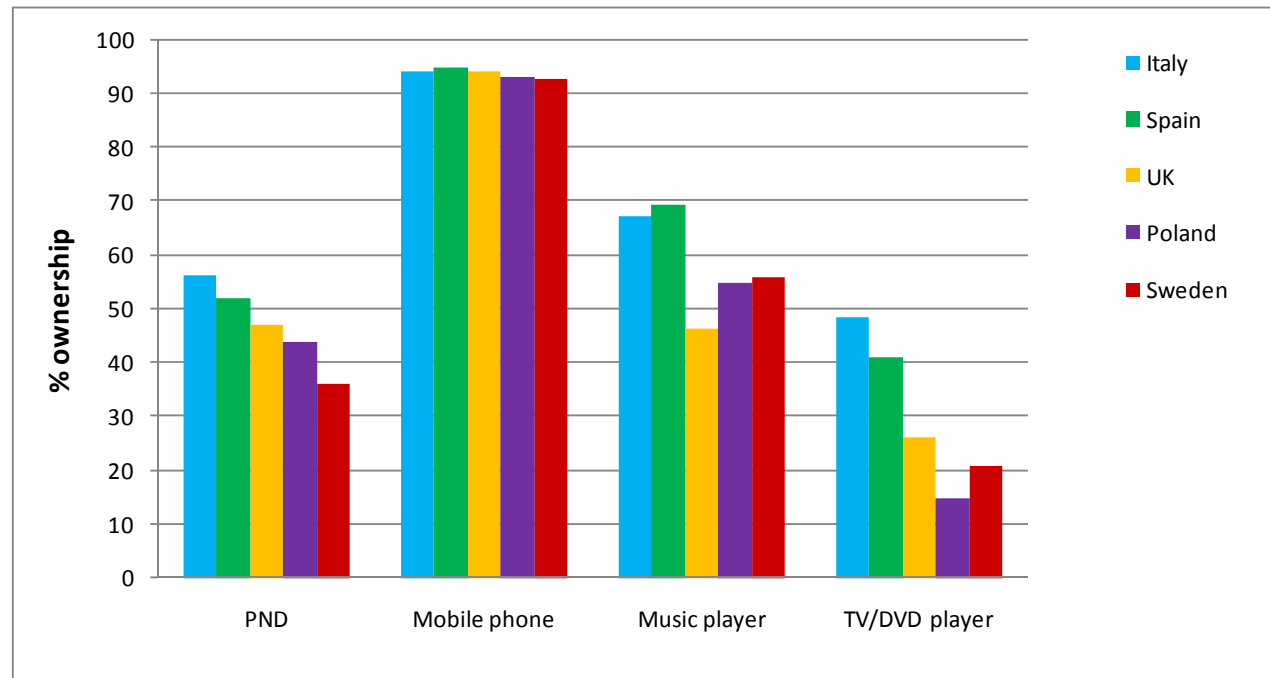
(B)

Cluster	PND	Mobile phone	Music player	TV/DVD player
1	Italy, Spain	Italy	Italy	Italy
2	UK	UK	Spain	Spain
3	Poland, Sweden	Spain, Poland	UK, Poland, Sweden	UK
4		Sweden		Poland, Sweden

# Nomadic device ownership - overview



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Ownership of mobile phones was consistently dominant (over 90% of the sample in each of the five countries) followed by PNDs and music players.

TV/DVD players were the least frequently owned, particularly in Poland and Sweden.

# Nomadic device ownership – statistical modelling



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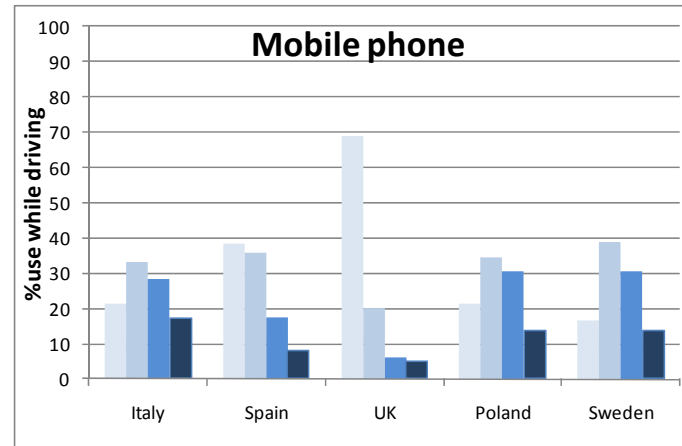
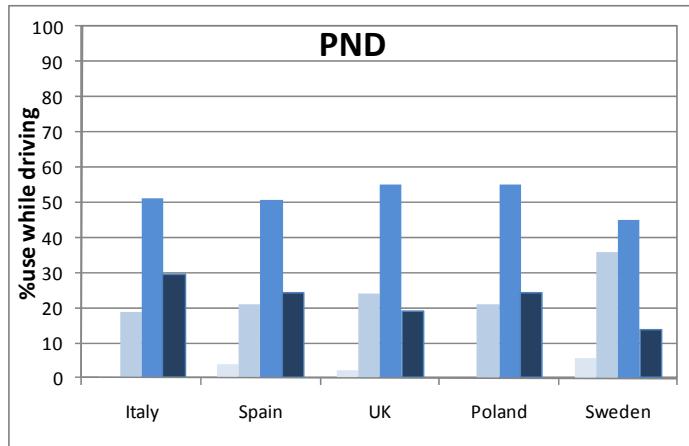
- PNDs: gender and mileage were significant predictors, with males being 1.45 times more likely to own a PND than females. Increasing mileage increased the likelihood of owning one
- Music players: Age predicted the likelihood of owning a music player, those aged 65+ were 0.22 times less likely than those aged 17-20 to own one.
- TV/DVD players: those in the 35-49 age category were 2.15 times more likely to own one compared to the youngest drivers
- Mobile phones: no significant predictors for ownership

# Use of Nomadic Devices while driving - overview



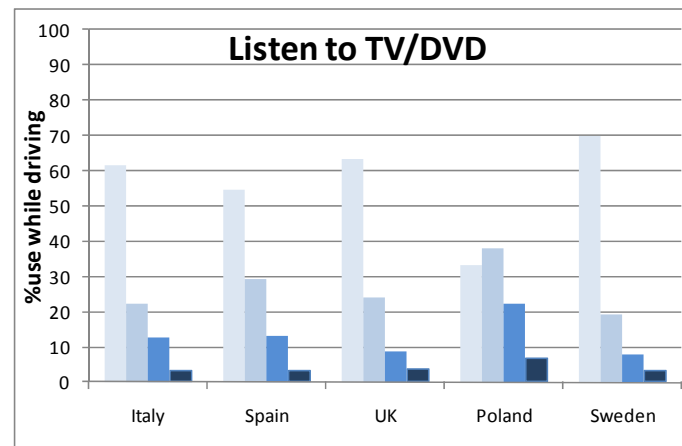
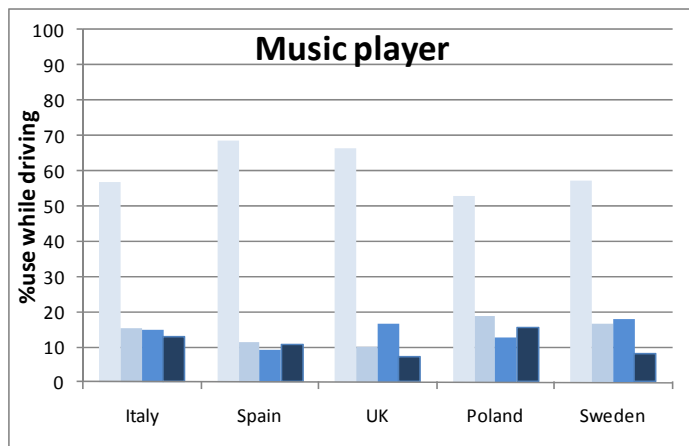
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Never Rarely Sometimes Often



PNDs the most frequently used when driving

Mobile phones (either hands-free or hands-held) were used less frequently



Of those who own music players and TV/DVD players, the majority of drivers claimed to never use them while driving.



# Use of Nomadic Devices while driving – statistical modelling



	PND	Mobile phone	Music player	TV/DVD player
<b>Use while driving</b>				
Age (reference = 65+)				
17-20				2.77
21-24		2.91		3.39
25-34		3.21		4.77
35-49		2.79		3.50
50-64				2.77
Gender (reference = Female)				
Male				
Mileage (reference = 30,000+km)				
<5000 km	0.26	0.20		
5,000-9,999 km	0.31	0.22		
10,000-14,999 km	0.43	0.34		
15,000-19,999km	0.48	0.47		
20,000-24,999km		0.46		
25,000-29,999km				

- i. Gender was not a predictor for any of the NDs
- ii. Those driving less than 20,000 km were less likely to use a PND or mobile phone while driving, compared to those driving more than 30,000 km)
- iii. Younger drivers were more likely to use their mobile phone and TV/DVD while driving (compared to those over 65 yrs)

	PND	Mobile phone
Cluster 1	Italy, Spain (1.48)	Italy (0.71)
Cluster 2	UK	UK (0.11)
Cluster 3	Poland, Sweden	Spain, Poland (0.40)
Cluster 4		Sweden

- i. Compared to those residing in the least stringent those drivers residing in Italy and Spain (the most stringent countries) were 1.47 times as likely to admit more frequent use of their PND.
- ii. Those drivers residing in Italy, Spain, Poland and the UK were less likely to use their phones often whilst driving, compared to Swedish drivers.



# Undertaking high-risk interactions - statistical modelling



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High risk interactions	PND	Mobile phone	Music player	TV/DVD player
Skill score	1.32	1.37		
Safety score	0.56	0.55		
Distracting to you				0.88
Likelihood of being stopped				1.09
Age (reference = 65+)				
17-20	2.18	14.67	5.19	
21-24	2.88	18.88	3.22	
25-34	3.27	14.98	2.79	
35-49	2.19	10.39	2.97	
50-64		4.51	2.67	
Gender (reference = Female)				
Male				
Mileage (reference = 30,000+km)				
<5,000km		0.42		
5,000-9,999 km		0.64		
10,000-14,999 km		0.53		
15,000-19,999km	0.61	0.59		
20,000-24,999km		0.56		
25,000-29,999km		0.51		

- i. Younger drivers were twice as likely to enter/change destinations, 5 times as likely (for the youngest drivers) to change their music selection, and 15 times as likely to text
- ii. Only in severe and “obvious” cases of distraction, i.e. watching a TV, did drivers’ evaluation of the distracting effects have an impact

	PND	Mobile phone	Music players
Cluster 1	Italy, Spain	Italy	Italy (2.10)
Cluster 2	UK (0.69)	UK (0.46)	Spain
Cluster 3	Poland, Sweden	Spain, Poland (0.60)	UK, Poland & Sweden
Cluster 4		Sweden	

- i. Those drivers residing in the higher legislated countries were just as likely to enter or change destinations in their PND, as those in the lowest.
- ii. Compared to Swedish drivers, UK drivers were half as likely to text, Italian drivers (with the strictest legislation), were just as likely to text as Swedish drivers.
- iii. Those in the more stringent counties were more likely to change their music selection  
In Italy, for example, drivers were twice as likely to change their music selection compared to Swedish, Polish and UK drivers.

# Conclusions



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- Whilst the results varied depending on the nomadic device, the relationship between legislation and use was not always straightforward.
- Mobile phone legislation, which is relatively simple and well promoted, was most clearly understood and adhered to.
- However, more complicated or less advertised legislation such as that pertaining to navigation devices and music players was poorly comprehended and, where present, generally not complied with.
- The study highlights the need for drivers to be presented with clear legislation, supported by educational and enforcement campaigns.

## Next steps.....



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- Simply legislating against an activity in the driving domain is not sufficient.
- For example, supplementing legislation with enforcement and education campaigns has increased the UK's front seatbelt wearing rates to almost 95%
- Examine ways of supporting existing legislation by potentially using technology to detect and prevent the use of nomadic devices where considered risky or outside the boundaries of human workload capabilities in dynamic driving situations.





- Thank you!
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