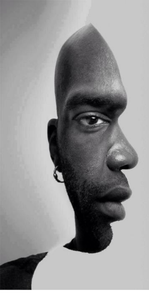

Changing Perspectives
1st International Conference on Transport & Health
July 6-8, 2015 London, England

TPH Link UCL

How drivers with brain pathologies deal with in-vehicle distraction, what are their emotions and driving habits: a questionnaire assessment

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European Union European Social Fund
OPERATIONAL PROGRAMME EDUCATION AND LIFELONG LEARNING
MINISTRY OF EDUCATION, LIFELONG LEARNING AND RELIGIOUS AFFAIRS MANAGING AUTHORITY
NSRF 2007-2013
Co-financed by Greece and the European Union

BACKGROUND

Driving is a complex task, which requires possessing cognitive, motor and visual skills and it is necessary for the drivers to have adequate motor strength, speed and coordination. The normal ageing process leads to declines in these motor and cognitive skills, and when combined with a cerebral disease, it may significantly impair the person's driving performance.

OBJECTIVES AND METHODOLOGY

- Analyze the self-reported driving behaviour of older drivers with brain pathologies, through an extensive questionnaire assessment
- Several brain pathologies examined include Alzheimer's disease (AD), Parkinson's disease (PD), Mild Cognitive Impairment (MCI) and some other cognitive disorders (PCA, FTD, RBD)
- 2 groups to compare - "healthy controls" vs "patients"

- The questionnaire that was developed and used in order to compare patients with healthy controls, includes 24 questions about:
  - their usual driving routines (driving and alcohol use, seat belt use etc.)
  - their self-assessment about their driving frequency and their driving performance
  - their possible avoidance of driving
  - their opinion about in-vehicle driver distraction (conversation with passenger or mobile phone use) and how they deal with it
  - their emotions while driving

SAMPLE SCHEME

- 137 drivers have participated in our research project
  - 44 are healthy individuals (63.1y.o.±7.1)
  - 93 have some brain pathology (68.7y.o.±8.7).
- They are all of similar demographic characteristics (similar level of education and similar driving experience).

ANALYSIS METHOD

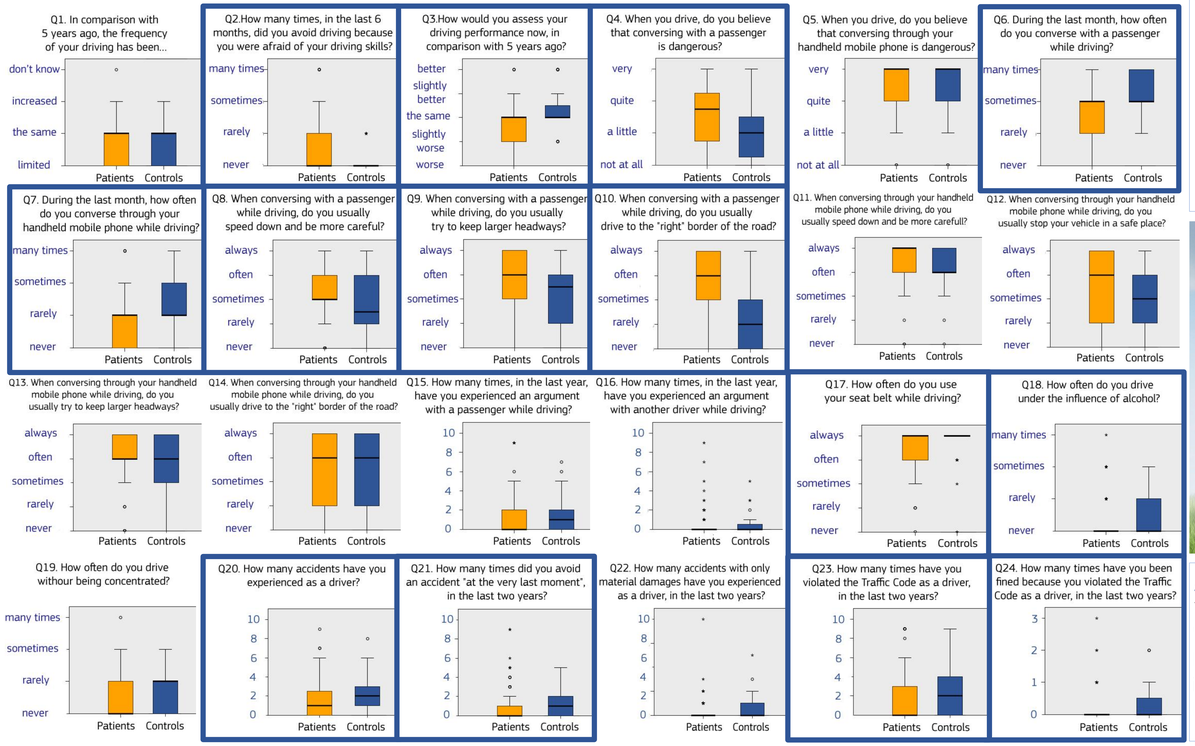
- All answers from all participants were analyzed through Kruskal-Wallis One-Way Analysis of Variance (nonparametric tests algorithms) techniques.
- Kruskal-Wallis test is a nonparametric test, and it assesses for significant differences on a dependent variable by a grouping independent variable.

QUESTIONNAIRE

Hypothesis Test Summary – Independent-Samples Kruskal-Wallis Test

ID	Question	Null Hypothesis	Sig.	Decision
Q1	In comparison with 5 years ago, the frequency of your driving has been...	The distribution **is the same** across "Controls" and "Patients"	0,166	Retain the null hypothesis.
Q2	**How many times, in the last 6 months, did you avoid driving because you were afraid of your driving skills?**		0,006	Reject the null hypothesis.
Q3	**How would you assess your driving performance now, in comparison with 5 years ago?**		0,000	Reject the null hypothesis.
Q4	**When you drive, do you believe that conversing with a passenger is dangerous?**		0,002	Reject the null hypothesis.
Q5	When you drive, do you believe that conversing through your handheld mobile phone is dangerous?		0,563	Retain the null hypothesis.
Q6	**During the last month, how often do you converse with a passenger while driving?**		0,048	Reject the null hypothesis.
Q7	**During the last month, how often do you converse through your handheld mobile phone while driving?**		0,000	Reject the null hypothesis.
Q8	**When conversing with a passenger while driving, do you usually speed down and be more careful?**		0,024	Reject the null hypothesis.
Q9	**When conversing with a passenger while driving, do you usually try to keep larger headways?**		0,006	Reject the null hypothesis.
Q10	**When conversing with a passenger while driving, do you usually drive to the "right" border of the road?**		0,000	Reject the null hypothesis.
Q11	When conversing through your handheld mobile phone while driving, do you usually speed down and be more careful?		0,195	Retain the null hypothesis.
Q12	When conversing through your handheld mobile phone while driving, do you usually stop your vehicle in a safe place?		0,174	Retain the null hypothesis.
Q13	When conversing through your handheld mobile phone while driving, do you usually try to keep larger headways?		0,332	Retain the null hypothesis.
Q14	When conversing through your handheld mobile phone while driving, do you usually drive to the "right" border of the road?		0,777	Retain the null hypothesis.
Q15	How many times, in the last year, have you experienced an argument with a passenger while driving?		0,397	Retain the null hypothesis.
Q16	How many times, in the last year, have you experienced an argument with another driver while driving?		0,847	Retain the null hypothesis.
Q17	**How often do you use your seat belt while driving?**		0,044	Reject the null hypothesis.
Q18	**How often do you drive under the influence of alcohol?**		0,048	Reject the null hypothesis.
Q19	How often do you drive without being concentrated?		0,213	Retain the null hypothesis.
Q20	**How many accidents have you experienced as a driver?**		0,022	Reject the null hypothesis.
Q21	**How many times did you avoid an accident "at the very last moment", in the last two years?**		0,022	Reject the null hypothesis.
Q22	How many accidents with only material damages have you experienced as a driver, in the last two years?		0,626	Retain the null hypothesis.
Q23	**How many times have you violated the Traffic Code as a driver, in the last two years?**		0,049	Reject the null hypothesis.
Q24	**How many times have you been fined because you violated the Traffic Code as a driver, in the last two years?**		0,047	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is ,05.



RESULTS - CONCLUSIONS

- 24 questions were analyzed through Kruskal-Wallis one-way ANOVA techniques and in 14 of them there were statistically significant differences between the two examined groups' answers
- Q2-3: Patients self-report, that they are likely to avoid using their vehicle because they are afraid of their driving abilities which they admit that have been deteriorated over the years
- Q4-7: Patients believe that conversing with passenger and using handheld mobile phone while driving are dangerous and they avoid to do so
- Q8-10: Patients self-report that when conversing with passenger while driving, they speed down, keep larger headways, and drive to the "right" border of the road
- Q11-14: Patients and controls have the same behaviour when using the mobile phone while driving (Q12: 50% of patients claim they stop the vehicle in order to use the mobile phone)
- Q15-16,19: All participants claim they are quite calm and concentrated when driving
- Q17: Patients use the seat belt significantly less times than controls
- Q18: Patients never drive under the influence of alcohol
- Q20-24: Overall, patients claim they don't have accidents and don't violate the Traffic Code

Drivers with brain pathologies are aware of their deterioration in their driving performance, and thus they are either very conservative while driving, or even they avoid doing so

ACKNOWLEDGEMENT

This research was carried out within the framework of the Operational Program "Education and Lifelong Learning" of the National Strategic Reference Framework (NSRF), namely the Research Funding Program: THALES. Investing in knowledge society through the European Social Fund, co-financed by the European Union (European Social Fund - ESF) and Greek national funds.