Driving Behaviour and Mental Status Correlation Models

Constantinos Antoniou
Associate Professor
National Technical University of Athens

Athens, 26 June 2015

Objective-steps

Objective

The presentation of the methodological tools and models that can support the combined analysis of the driving behavior and mental status

Methodological steps

1. Research questions: general vs. specific
2. Considering latent variables
3. Types of analysis
4. Integrated methodological framework

Research Questions – General vs. specific

C1 How **cerebral diseases** affect **driving performance**, especially at unexpected incidents.

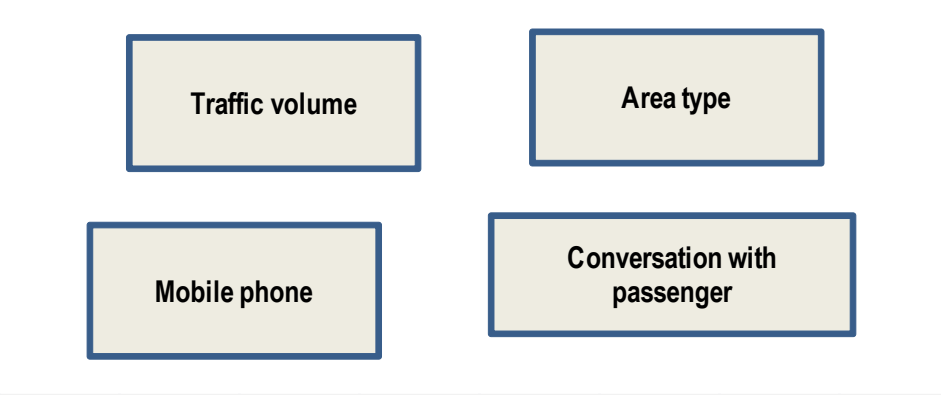
e.g. How **MCI** affects **reaction time**, at unexpected incidents.
How **AD** affects **driver speed**, etc.

D6 Analysis of the impact of **driver distraction** on **traffic flow** and **road safety**

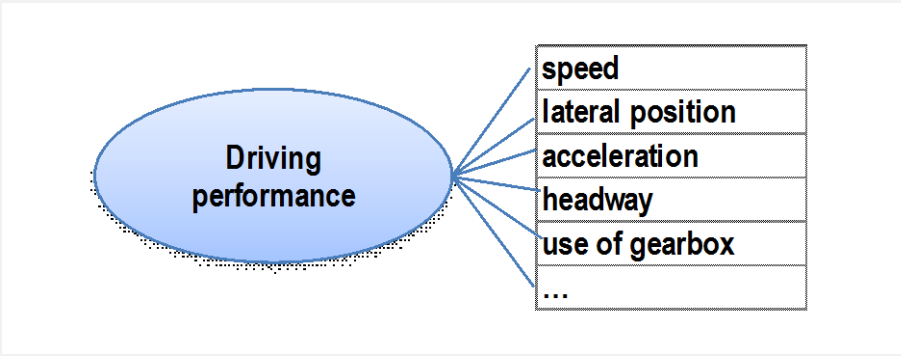
e.g. Analysis of the impact of **mobile phone** on **speed variability** and **reaction time**
Analysis of the impact of **conversation** on **lateral position**, etc.

Types of variables - Observed vs. latent variables

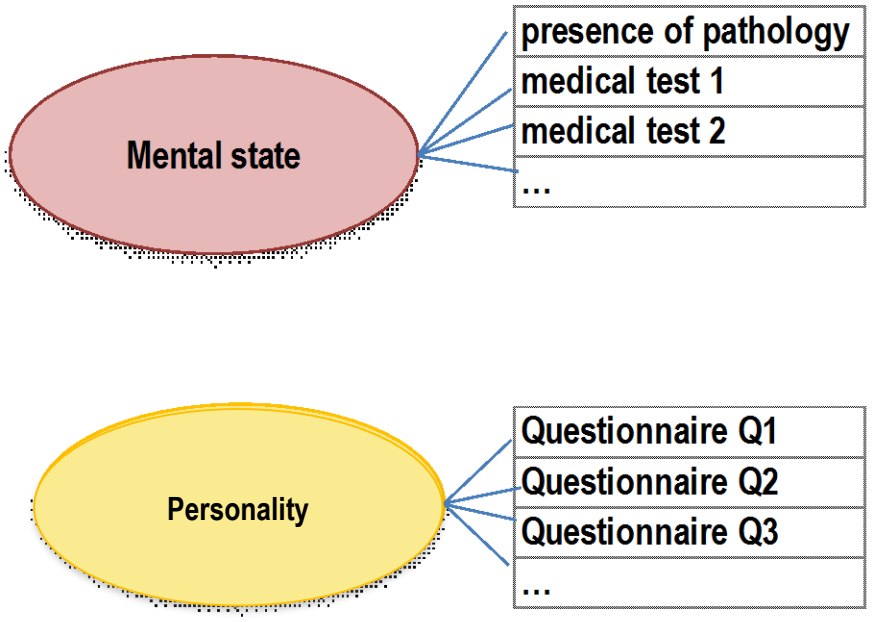
Observed variables:
individual measures (of distraction, driving performance, neuropsychological factors etc.)
other external factors

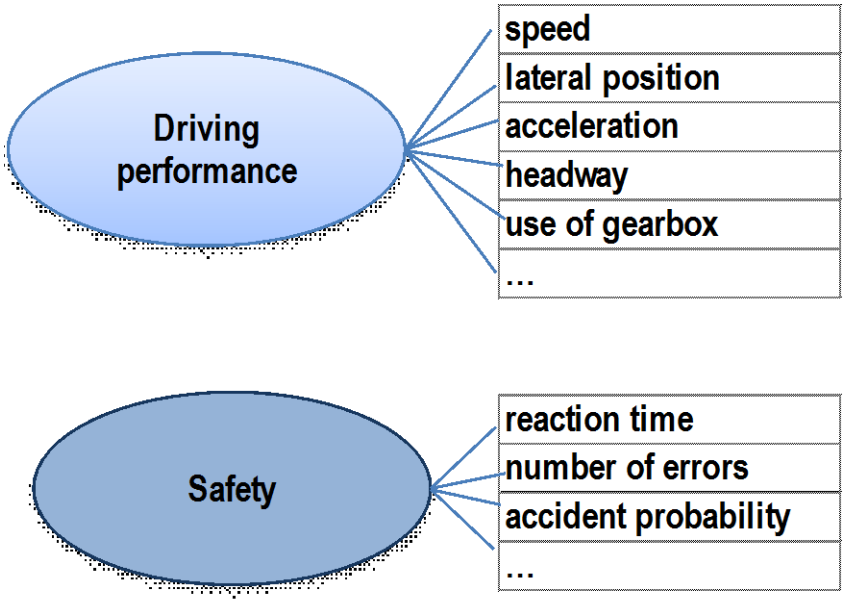


Latent variables:
unobserved factors, to be defined on the basis of composite variables (e.g. “distractibility”, mental state, risky driving)



Types of variables - Latent variables examples





Methodologies - Types of analysis

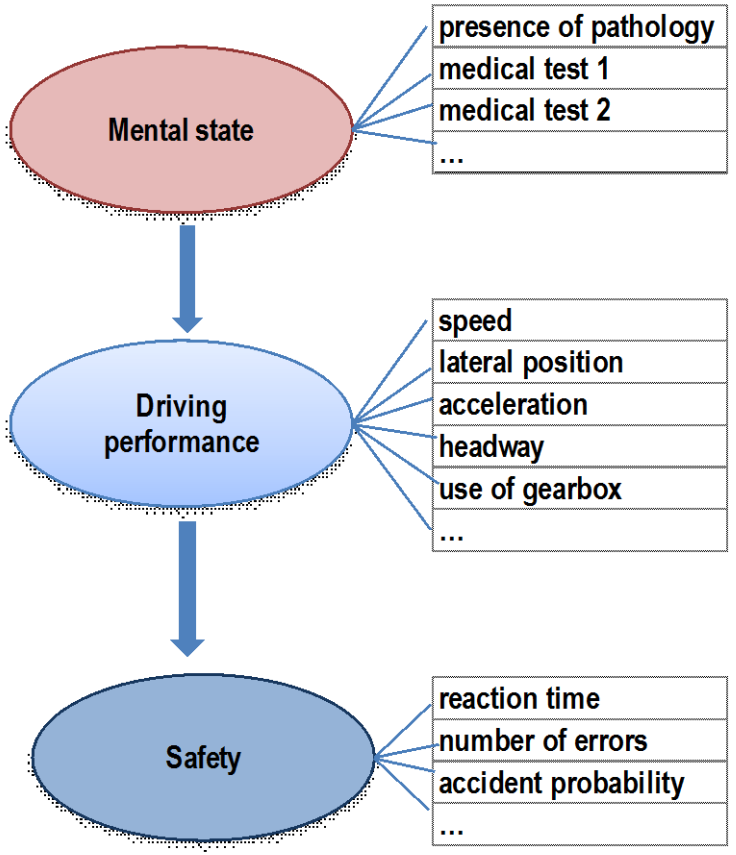
B. Addressing general questions

1. Estimation of effects

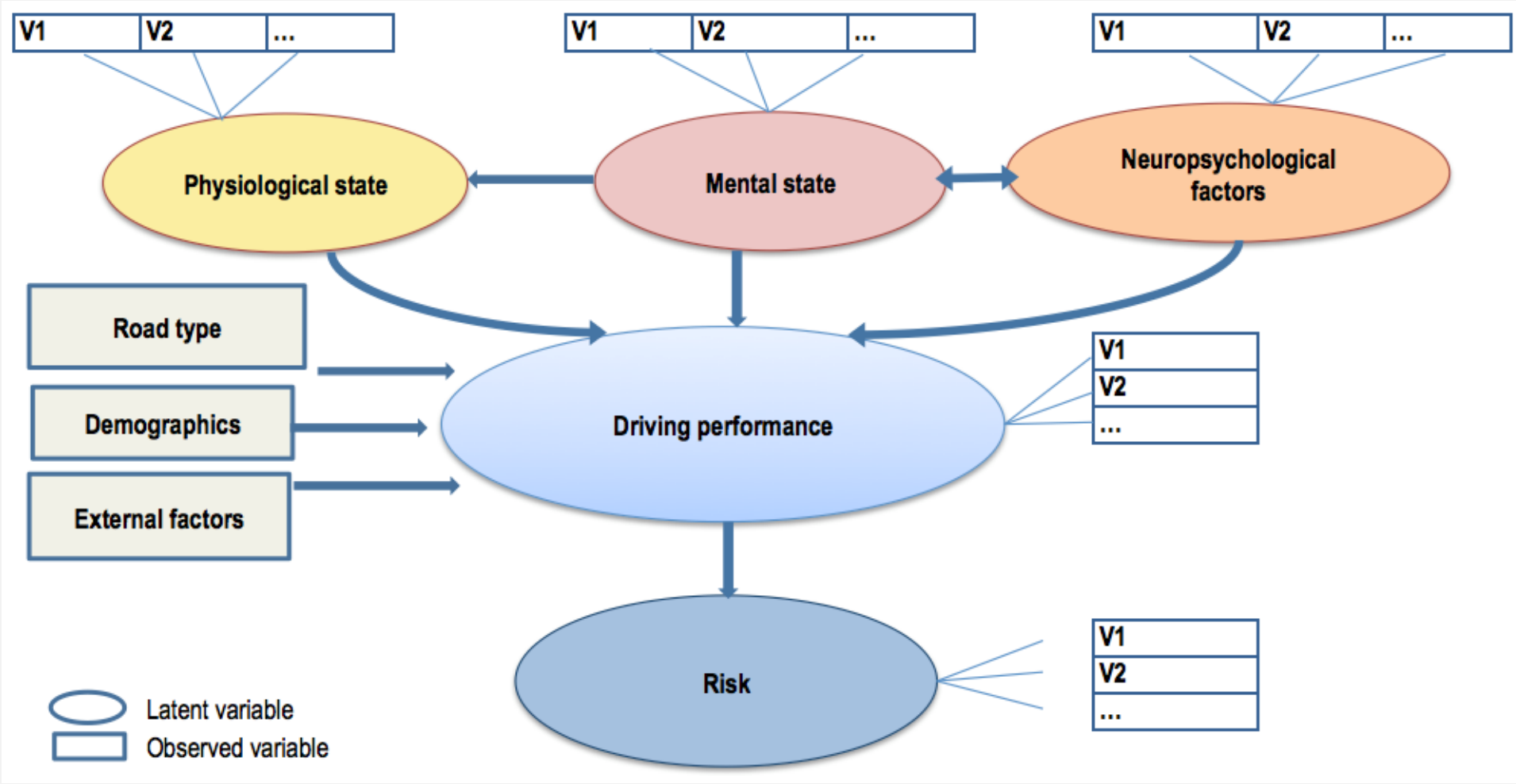
- Principal Components Analysis (Grouping Variables)

2. Analysis of complex relationships between latent variables

- Structural Equation modelling (estimation of composite / latent variables and their correlations)



Analysis framework - Overview



Driving Behaviour and Mental Status Correlation Models

Constantinos Antoniou
Associate Professor
National Technical University of Athens
users.ntua.gr/antoniou – antoniou@central.ntua.gr

Athens, 26 June 2015