

# *Fit to Drive*

4th International Traffic Expert Congress  
Tallinn from June 4th - 5th 2009



Welcome



## **Cognitive and Performance Differences Among Novice And Experienced Drivers**

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## Introduction: Novice Drivers

- High rate of accidents among novice drivers (*Mayhew et. al, 2005,2006*):
  - 17 years old drivers account for less than 2% in the US population
  - Account for 4% of fatal accidents
  - Account for 6% of injury–causing accidents
  - Up to 9 times the fatality rate of older drivers
  - Implications for others (63.8% of fatalities) (*AAA, 2006*)
- One year learning curve (*Kirk & Stamatiadis, 2001*)



## Introduction: Accidents Factors- Novice Drivers

- Driver's environment (driving at nighttime)
  - Driver's behavior (speeding)
  - Driver's skills (pressing gas instead of brake)
- 
- Driver's cognitive abilities (perception, attention and other)

**EXISTING  
INTERVENTION  
PROGRAMS**

## Existing Intervention Programs

- Main goal: Reduce driver's risk on the road
- Reactive not preventive

### The 'Novice Driver's Paradox'

- The need for “off-road” intervention programs and the importance of cognitive skills

## Research Goal

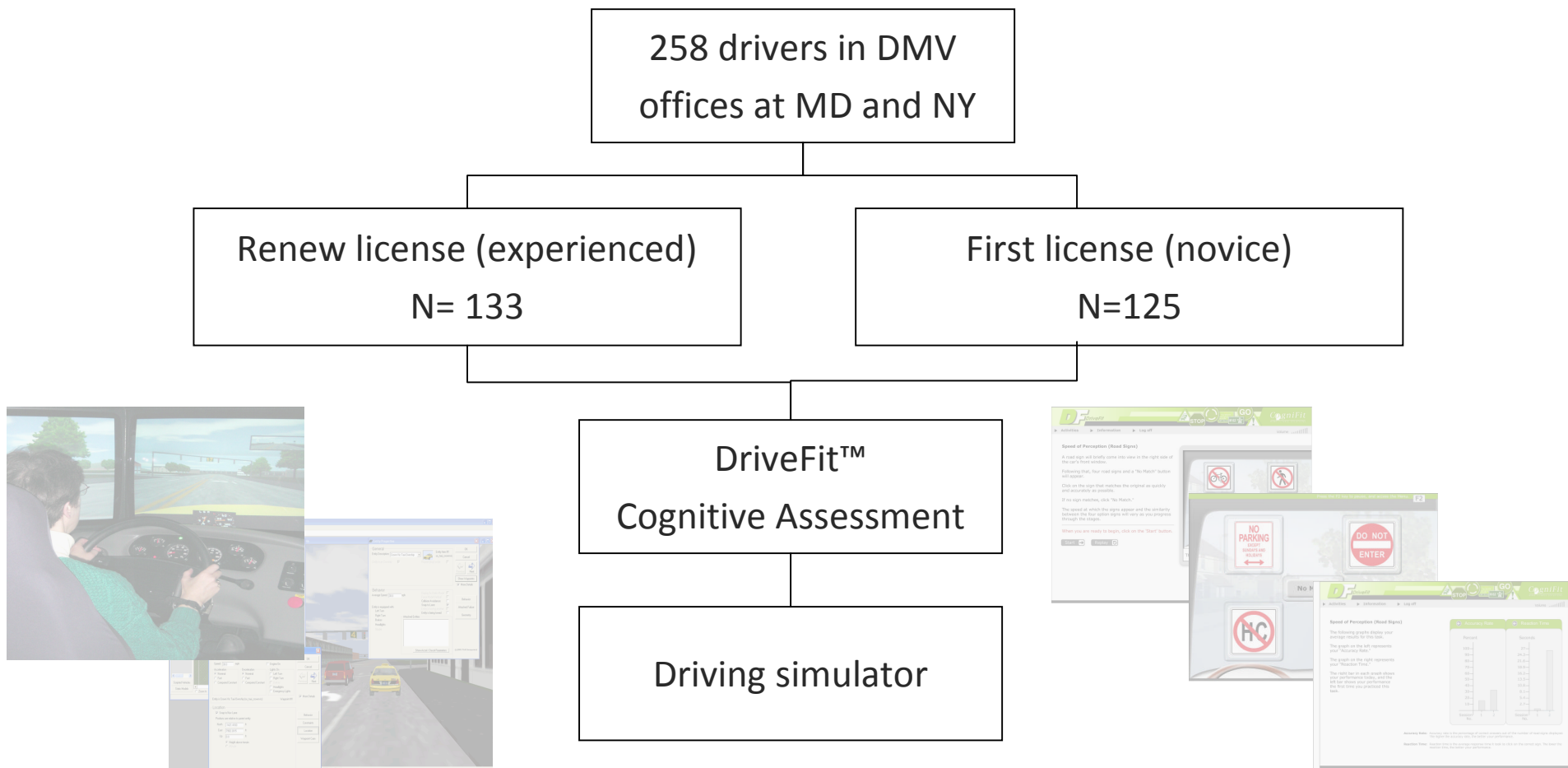
- Differentiate between novice and experienced drivers
- Supply the foundation for new training programs

### 3 parameters were used:

1. Cognitive skills
2. Rating of driving safety
3. Accidents rate



# Design and Method





## Key Findings- driving safety and accidents rate

- Novice drivers' simulator drives were rated as 38% less safe by two independent evaluators ( $p < .01$ )
- Novice drivers had 68% more simulator accidents ( $p < .01$ )



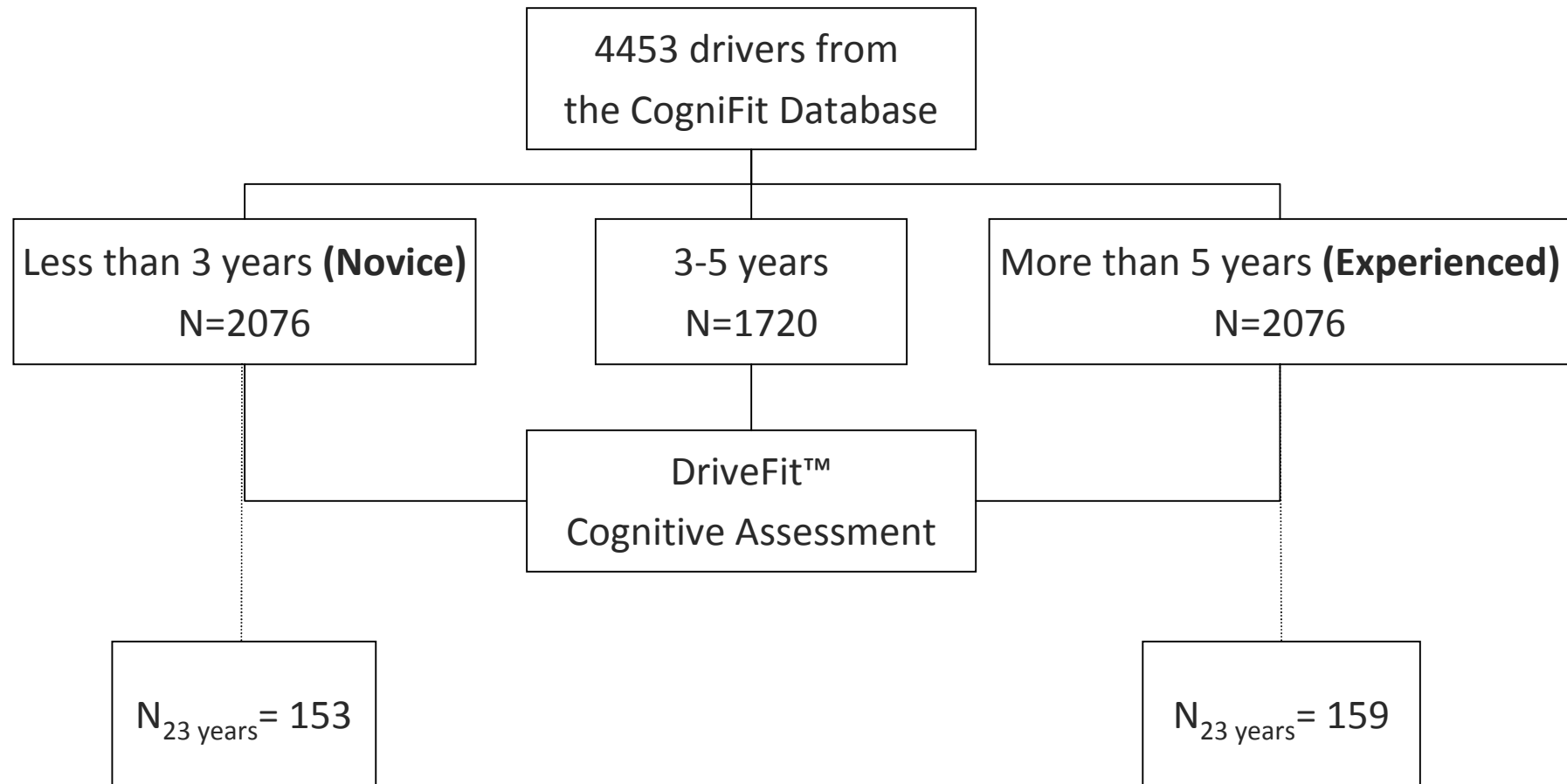
## Key Findings- cognitive Skills differences

- Out of 12 abilities measured, Novice drivers were:
  - More affected by distractions ( $p < .05$ )
  - Slower to react under divided attention ( $p < .05$ )
  - Less successful in inhibiting an action ( $p < .05$ )
  - Less accurate in perceptual tasks ( $p < .05$ )
  - More overconfident ( $p < .05$ )
  - Higher on risk taking ( $p < .01$ )

**CAN AGE, RATHER THAN EXPERIENCE, EXPLAIN THESE FINDINGS?**



## Study 2- design and method



## Key findings

- No cognitive differences were found between different age groups
- Significant difference between experience groups were discovered in:
  - Distractibility ( $p < .05$ )
  - Divided attention ( $p < .05$ )
  - Perceptual skills ( $p < .05$ )
  - Inhibition ( $p = .053$ )
  - Overconfidence ( $p = .09$ )

## Conclusions and future research

- Novice drivers lack some key cognitive skills when compared to experienced drivers
- Significant differences in accidents rate and driving safety were also found
- This study lay the foundation for new, cognitive-based training programs for novice drivers
- Future research will have to further explore the connection between cognitive fitness and on the road risk

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# THANK YOU!

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